

The most beautiful ingenious and instructive "Wall Chart" ever produced—The greatest mass of Knowledge, Science and Art ever before attempted in the same space—Executed in the first style of art—Printed in twenty-one oil colours. No office, home, or school should be without one.

NEW
CHROMO-LITHOGRAPH
THE
PICTORIAL VIEW OF THE WORLD.

COMPILED BY G. W. BACON, F.R.G.S.

(Printed in the finest style of Chromo-Lithography.)

EXPLANATION.

The Hemispheres.

The Map of the World shows at a glance all Kingdoms, States, and Countries in separate colours. The Ocean Currents are distinctly indicated; the cold currents are coloured blue, warm currents red, and the direction of each is shown by arrows. A brief description of these currents is given on the chart, and a full description in the book (page 67). The limits of icebergs on both hemispheres are shown by the white lines. *The Steamship Routes* to every part of the world are shown by the dotted lines. *The Ecliptic*, or apparent path of the sun, is also shown, with the Signs of the Zodiac. The dates along the Ecliptic indicate the sun's position at the end of each month. (See book, page 64).

SECTION

Above the hemispheres (at the left) is given some particulars of the discovery of America and the early settlements. On the right is an explanation of the motions of the earth, of latitude and longitude, &c.

The Time Dial Plate.

The Time Dial Plate shows the time of day in the principal cities of the world when 12 o'clock, noon, in London. The **large dial** in the centre represents London time. The dials in the **inner circle** represent European cities; those in the **middle circle** American cities; and those in the **outer circle** places in other parts of the world. Underneath the Dial Plate, is **the rule**, for determining the difference in time in any part of the world.

To make the reckoning of time still more clear, dials are placed on the hemispheres along the equator 30 degrees apart, by which the time is seen at a glance. Those east of the Greenwich Meridian are each two hours faster than the one preceding it, and those west of Greenwich two hours slower.

The Great Battles.

In six columns at the top of the Chart is a list of 125 of the greatest battles of the world, giving the date of each, and stating the victors and the names of the generals. They are arranged in order of date; those printed in capitals are the **15 Decisive Battles** of the world according to Professor Creasey. The naval battles are distinguished thus *, and the sieges thus †. The list begins with Babylon, the great battle in ancient history, B.C. 538 years, and ends with Candahar, 1880. The principal battles are described in the book in the same order (pages 1 to 25).

Flags and Arms of all Nations.

Next below the list of battles are arranged 38 flags and arms of all nations, each coloured with its proper colours, a full description of which is given in the book, page 46.

Varieties of the Human Race.

The row of portraits above the Hemispheres represent the principal varieties of the human race, arranged in their three great divisions—white, black, and yellow races.

A brief account of the different races is given, stating what part of the world each inhabits. Eight pages are also devoted to this subject in the book, pages 51 to 58.

The Great Discoverers and Explorers.

In the four corners are the portraits of four of the great discoverers and explorers—**Columbus, Cook, Humboldt, and Livingstone.**

The Coins of all Nations.

In the border the coins of different countries are represented in exact size, with their value in English and American money. The silver coins are at the sides, and the gold coins at the bottom. Three pages are given to this subject in the book, 48 to 50.

Costumes and Scenery.

The various peoples of the world are represented in their national costumes, picturesquely arranged amidst characteristic scenery of each country. (See pages 59 and 60 of the book.)

The Solar System.

Below the hemispheres is a complete plan of the Solar System, showing the planets and their orbits round the sun, the distance of each from the sun, and the length of its year, etc., (see pages 61 to 66). Above is an explanation of the fixed stars, asteroids, comets, and meteor showers.

The Great Inventions and Discoveries.

Immediately below the hemispheres is a list of 100 of the great discoveries and inventions of the world; the list on the left being geographical and scientific, and that on the right commercial and industrial; all arranged in order of date, with the names of the discoverers or inventors.

The Mountains, Rivers, and Waterfalls.

Below the hemispheres are shown the principal mountains of the world with their comparative heights; the volcanoes being specially indicated. The comparative lengths of the rivers are shown in a similar manner. The comparative heights of the Water Falls are also shown at one view, the name of each being underneath.

Great Men.

In the centre, at the bottom of the chart, is a list of 100 of the great men of the world, with the years of their birth and death all arranged in the order of date. A brief Biography of the principal of these is given on pages 26 to 40 of the book. •

Statistics of the World.

The area, population, religion, and government of all the countries of the world are given in tabular form. Also a list of 140 of the principal cities with their populations.

HANDBOOK.

With the Chart is presented, *gratis*, an explanatory Handbook of 80 pages, in which is given information of a more detailed character concerning the subjects illustrated on the Chart, and an alphabetical index to all the towns named on the Hemispheres: names of towns that are abbreviated in the map, for want of room, will be found spelt in full in this index.

The first 40 pages of the book—the history of the battles and the lives of the great men for the past 2,500 years—together form the most complete outline of universal history that has ever been condensed into the same space.

The Chart, together with the Handbook, constitute a most useful and concise compendium of general and scientific knowledge, the like of which was never before presented.

H A N D - B O O K

TO THE

Pictorial View of the World.

INCLUDING

Its Position in the Solar System—Its Climates and Seasons—
Its Political Divisions Its Physical Features—Its Tides and
Currents—Differences of Time—Its Inhabitants and their Vari-
eties, Costumes, and Habits—Its Great Men and their Lives—
An Account of its Great Battles—Its Flags and Arms—Its
Currency and Coinage—The Statistics of Area, Population,
Religion, and Government—The Great Inventions and their
Effects On the World's Progress.

EDITED BY G. W. BACON, F.R.G.S.

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1882.

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P R E F A C E .

The object of this book is to complete the information contained on the "Pictorial View of the World."

The various sections of the book deal *seriatim* with the corresponding sections of the chart, but the grouping is here somewhat altered, so as to give a more logical sequence to the whole. Thus the historical portions are given first, then follows the information concerning the human race, and finally the scientific matter and geographical index.

While the main object of the book has been kept in view, yet every effort has been made to render the matter specially interesting, as well as concise and simple, and thus an independent value has been given to the book, which will be found intelligible to ordinary readers and to children, and also of much value apart from the chart.

Historical Sketch of the . Great Battles Of the World;

BEING AN OUTLINE OF

UNIVERSAL HISTORY.

Babylon (Babylonia, B.C. 538).—This, the greatest city of antiquity and the capital of the Babylonian empire, was taken by the Persians under Cyrus the Great, who diverted the River Euphrates from its course, and caused his soldiers to march along its bed to the gates of the city. Belshazzar, the king of Babylon, was a mere voluptuary, and too indolent to go out to meet the warlike Persian mountaineers, and even when they were near his capital he spent his time in feasting. The consequence was that, when Cyrus arrived at the gates with his army, he found them open and unguarded. The Persian monarchy was greater than either the Babylonian or the Median, and as it afterwards came into collision with Greece, it is important in the history of the world.

Marathon (Greece, B.C. 490).—The Persians, under Darius, had landed in vast numbers in Attica, and the small states into which Greece was divided were still disunited, in spite of the common danger. But the Athenian army, under Miltiades, though absurdly inferior in numbers, met the Persians on the Plain of Marathon, overlooking the sea, about 20 miles from Athens, and totally defeated them, even destroying part of their fleet, to which they fled. This victory was exceedingly important

in its results, for it taught the Greeks their superiority to the Persians in spite of their wealth and numbers.

Thermopylæ (Greece, B.C. 480).—Ten years after Marathon, Xerxes, the successor of Darius in Persia, led an enormous host, numbering 1,200,000 men, into Greece by land. The mountains of Thessaly close the passage into Greece proper, save by one or two passes, one of which, a narrow defile between the mountains and the sea, is called Thermopylæ (Hot gates), owing to the thermal springs there. Greece had failed to unite, as before, but a small detachment of Spartans (300 in number) was sent to dispute the entrance into Greece while the main body of the Greeks was being moved up. This little band, under Leonidas, king of Sparta, resisted every attempt of the Persians—even with the flower of their army, the 10,000 “Immortals”—to force the passage, until a path over the mountains, revealed by treachery, enabled them to attack the Greeks from the rear, and the Spartans were then overwhelmed, and all perished save one. A monument afterwards erected on the spot bore this inscription:—“Stranger, tell the Lacedæmonians that we lie here obeying their laws.”

Salamis (Greece, B.C. 480).—Xerxes, entering Greece after Thermopylæ, overcame the Athenian army, which was abandoned through the other Greek states having selfishly determined only to defend the Isthmus of Corinth, and Athens was taken and destroyed. The Athenians, who were a maritime people, took to their ships, and lay between the Isle of Salamis and the land of the Gulf of Ægina. The fleets of the other Grecian states now joined them, but were afraid to fight, none of them, save the Spartans and Athenians, having yet actually met the Persians. Themistocles, the Athenian leader, however, by feigning to be secretly the friend of the Persians, persuaded them to attack the Greeks, who, he said, were caught in a trap between the island and the shore, and would fall an easy prey. The deception succeeded, and Xerxes had a gorgeous throne built on a cliff that he might thence witness his enemy's annihilation. But, as Themistocles had foreseen, the numbers and unwieldiness of the Persian vessels prevented their manœuvring in the confined channel, and they fell into hopeless confusion and fouled each other, so that victory was easy for the Greeks, and the great Persian fleet was completely destroyed, Xerxes himself escaping with difficulty to Asia. The land army remained in Greece, but was defeated at Platœa in the following year, and the safety of the Greek cities of Asia Minor was secured about the same time by the defeat of another Persian fleet at Mycale, on the Asiatic coast, and Greece was thus completely delivered from all fear of further

invasion. This war is one of the most important in history, on account of its consequences. It was the victory of the West over the East, of freedom over despotism, of courage over numbers; and western civilisation is the fruit of the seed sown at Marathon and Salamis.

Syracuse (Sicily, B.C. 413).—The long siege of Syracuse was an episode in the great civil war (the Peloponnesian) which ruined Greece. The town was a Dorian colony, and hence the Athenians, who were Ionians, fitted out an expedition against it. The Spartans, as Dorians, aided the inhabitants, and, after a long siege and numerous battles, the Athenian army and fleet were totally destroyed. From this disastrous attempt Athens never recovered, and it formed the turning-point in the 28 years' war, which ended in the complete overthrow of the Athenian power in 404, when Athens was taken by Lysander, the Spartan.

Leuctra (Greece, B.C. 371).—After the taking of Athens, Sparta was the leading state in Greece for 30 years, until defeated by the Thebans under their great ruler Epaminondas. This led to more dissension among the Greeks, and prepared the way for the Macedonian conquest.

Chæronea (Greece, B.C. 338).—This battle was gained over the Athenians by Philip, king of Macedon, father of Alexander the Great, and resulted in the subjugation of Greece proper by the growing power of the northern monarch, against whom Demosthenes had used his oratory in vain. Philip's conquests were gained as much by money and diplomacy as by force of arms.

Rome (Italy, B.C. 390).—The siege of Rome by the Gauls, under Brennus, is involved in fable, but the fact of the capture and burning of the city by a Keltic tribe in this year is certain. The garrison of the Capitol or citadel was at last delivered by a relieving army, under Camillus, who was called the second founder of Rome. The legend of the preservation of the Capitol by Manlius, awakened by the cackling of the sacred geese, and much of the story of Camillus, are additions made by the vanity of great families in Rome desirous of glorifying their ancestors.

Issus (Asia Minor, B.C. 333).—The second of the brilliant series of victories of Alexander the Great over the Persians, under Darius Codomanus, took place here. The young Macedonian conqueror crossed the Hellespont into Asia Minor, and after winning the battle of the Granicus passed through Asia Minor to Issus, where the Persians, 400,000 strong, were prepared to dispute his march into Syria. Alexander defeated them with a loss of 100,000 men, and vast treasures and the whole family of Darius fell into

his hands. This victory opened the way for the conquest of Syria and into the heart of the Persian Empire. Alexander was, however, delayed some time by the siege of Tyre, and then proceeded to Jerusalem and the conquest of Egypt, where he founded Alexandria. All this was made possible by the victory of Issus.

Arbela (Persia, B.C. 331).—The third and crowning victory of Alexander, who had passed from Egypt into Persia, was achieved at Arbela, in the Euphrates and Tigris valley, where the Persian and Macedonian monarchs met in a last struggle for empire in the east. The Macedonian victory was complete, and Darius fled, to be murdered while hiding by one of his satraps. Alexander took Susa and Persepolis, the capitals, and made himself master of the Persian Empire.

Cannæ (Italy, B.C. 216).—Rome had been slowly growing into power, and the struggle for supremacy with the great maritime republic, Carthage, was the crisis of her history. The first Punic war (264-241 B.C.) only intensified the hostility of the two nations, and the second Punic war broke out in 218 B.C. The Carthaginian general, Hannibal, had marched from Spain across the Alps, and, descending into Italy, had defeated the Romans in several smaller engagements. Avoiding Rome itself, he pushed southwards into Apulia, where he completely overthrew the Roman army, and at Cannæ Rome itself was almost at his mercy. He, however, did not follow up the advantage, but gave the Romans time to recover, and hence the fruits of the victory were not very important, though the day of the battle was afterwards regarded as the most disastrous in the annals of Rome.

Metaurus (Italy, B.C. 207).—This was a victory gained by the Romans over Hasdrubal and the Carthaginians. It enabled Scipio to destroy the power of Carthage in Europe, and by the capture of the new capital, Carthagera, to transfer the seat of war to Africa. It was the turning point of the war, in which hitherto Carthage had been successful.

Zama (N. Africa, B.C. 202).—This battle was fought in Africa, the Romans having carried the war from Italy and Spain into the Carthaginian territory itself. Cornelius Scipio here defeated Hannibal, and brought to a close the second Punic War by a peace dictated by Rome. He was surnamed Africanus in honour of the victory.

Corinth (Greece, B.C. 146).—The advance of the Romans into Greece had begun some 50 years earlier, but the capture of the city of Corinth, with all its artistic treasures, completed the

subjugation of the country. The semi-barbarism of the Romans was here contrasted with Greek culture by the wanton destruction of art treasures and the sale of exquisite Greek statues by weight as marble. The desolation of Greece followed in B.C. 145.

Carthage (N. Africa, B.C. 146).—In the same year Scipio the Younger completed the downfall of Rome's great rival, the maritime republic of Carthage, and thus closed the third Punic War. The city was stormed street by street in a seven days' battle and burnt to the ground. For many years its site remained a desert, and its exact locality is still doubtful, although another city bearing its name grew up close at hand.

Pharsalia (Macedonia, B.C. 48).—This great battle terminated the struggle between the two great rivals, Pompey the Great and Julius Cæsar, for the empire of the Roman World. The two generals had been leaders of opposite parties for years, and Cæsar, having trained an army in his wars in Gaul and Britain, was able to crush his rival, who was killed on the shores of Egypt, after his flight from the battle-field, leaving Cæsar master of what was then the civilised world.

Zela (Asia Minor, B.C. 47).—After the death of Pompey, Cæsar supported Queen Cleopatra of Egypt against her brother, who sought to prevent her sharing the sovereignty, and then passed into Asia Minor, where, in a campaign of a few weeks, he overcame all opposition, and defeated Pharnaces, King of Pontus, at Zela. It was after this battle that he sent his famous message to the Senate, "*Veni, vidi, vici*" ("I came, I saw, I conquered").

Philippi (Macedonia, B.C. 42).—The Republicans in Rome conspired and murdered Cæsar (44 B.C.), lest he should become a despot, but their crime caused a civil war, which was terminated by the battle of Philippi, in Macedonia, gained by Cæsar's party, under the command of his friend Mark Antony and his adopted son Octavius. Brutus and Cassius, the leaders of the conspirators, were both killed.

Actium (Greece, B.C. 31).—Some years were spent in crushing the remains of the Republican and Pompeian parties, and when they were subdued, Antony and Octavius quarrelled. Their fleets met at Actium on the west coast of Greece, and Antony lost the battle through following the flight of Cleopatra, Queen of Egypt, in the midst of the action. His infatuation thus cost him the empire of the world, which fell to his rival Octavius, who assumed the title of Augustus Cæsar. The Empire of Rome is usually dated from this victory.

The Romans (Westphalia, A.D. 9).—From the days of Julius Cæsar, who crossed the Rhine, the Romans had penetrated continually further and further into Germany. In this year Quintilius Varus was lured by the absence of any show of resistance far into Westphalia. But Hermann, or Arminius, as the Romans called him, Prince of the Cheruskans, had formed a league of many German tribes, and when the unsuspecting legions were passing through the swamps and hills of the Teutoberg Forest, he suddenly fell upon them from all sides. Taken by surprise and at a disadvantage, the Romans fled, but a running fight was kept up for days, until their destruction was complete, and Varus killed himself in order not to survive his disgrace. A colossal statue of Hermann now stands upon a hill top as a monument of this first serious defeat of the conquering armies of Rome.

Jerusalem (Palestine, A.D. 70).—The Jews, under the leadership of a self-styled Messiah, revolted against the Roman authority during the reign of Nero. Vespasian (afterwards Emperor) was sent to quell the rising, and met with a fierce resistance. The Jewish capital was at length invested, when Vespasian returned to Rome to assume the Imperial purple, leaving the conduct of the siege to his son Titus, who carried it on with great vigour. The inhabitants maintained an obstinate defence, and suffered the greatest horrors, but at the end of five months the city was taken and burnt, and the survivors sold into slavery. It is said that no less than 100,000 Jews died during the siege.

Adrianople (Turkey, A.D. 323).—In this battle Constantine defeated his brother-in-law Licinius, his last rival for the Imperial throne, and from this battle is usually dated the commencement of the Christian Empire of Rome. Constantine had been converted some ten years earlier, in the following manner. It is said that he saw in the sky, before his last battle with another rival, Maxentius, a luminous cross bearing the motto "*En toutô nikê*" ("In this (sign) conquer"). After the victory he avowed himself a Christian, and adopted the cross as his standard, called the *Labarum*.

Rome (Italy, A.D. 410).—The Romans, gradually growing effeminate and corrupt, took the warlike Goths into their armies. Alaric, one of these, saw the weakness of the Empire and revolted. Being successful, he became King of the Visigoths, invaded Italy, made himself really master of it, and in A.D. 410 sacked Rome during six days, in revenge for a treacherous attack made on his troops.

Chalons (North of France, A.D. 451).—During the early part of the 5th century, whole tribes of Mongolian origin poured from Asia into Europe, and the Huns, at once the most terrible and the most numerous, overran all Northern Europe. They would probably have annihilated the Roman empire but for the victory gained by Aëtius at Chalons on the Marne. This battle was one of those to which we owe the preservation of Christendom from the hordes of savage Asiatic barbarians.

Crayford (Kent, A.D. 455).—In what is now a quiet Kentish valley, the ancestors of the English race began the conquest of England from the British or Welsh. These Saxons were feared as the most terrible pirates and redoubtable warriors throughout Western Europe, and they had been summoned in 449 by Vortigern, the British King, to aid him against the invading Scots. Seeing the fertility of the country, they settled in it, and soon turned against the British, whom they defeated at Crayford. They were heathen, and ruthless in warfare, the British being not only conquered, but exterminated everywhere, save in the hilly regions of Wales, Cornwall, and Devon.

Badon Hill (Bath, Somerset, A.D. 511).—The Britons were steadily driven back by the Saxons, who were continually strengthened by new arrivals from the Continent; but they made some successful stands against the enemy, so that the conquest was slow. The traditions of their successes all cluster round Arthur, the hero of the later romances, and one of his great victories was gained near Bath in this year. Others followed, but they were powerless to check the Saxons, though magnified in the Celtic poetry. This King Arthur is the hero of Tennyson's poem, "Idylls of the King," founded upon the poetical Welsh legends, which beautify while distorting history.

Alexandria (Egypt, A.D. 650).—The new Mahometan Empire was crowned by the taking of Alexandria. Mahomet himself had conquered Arabia at his death (632), Omar, his successor, conquered Syria and took Jerusalem (637), and Ali had overrun Persia in 638. Amrou, after the conquest of Egypt, pushed westward, and the empire of the Khalifs soon extended to the Atlantic, along the coast of N. Africa.

Tours (Central France, A.D. 732).—The Saracens, having carried their conquests through Northern Africa, crossed into Spain and overran it, and then invaded France, boasting that they would conquer Europe and return to Asia by Constantinople. They were met, however, by the French king and his great vassals at

Tours, and were there defeated, their further progress being effectually stopped, and their sway confined to Spain. By this battle Christendom was delivered from the Mahomedans, as it had been previously saved from the Huns, under Attila.

Edendune (Wilts, A.D. 878).—In this battle King Alfred finally overthrew the Danes, under Godrun or Guthrum, but allowed those of them who became Christians to settle in East Anglia. By this victory a period of peace was secured, which the king zealously employed in the improvement of the country and the encouragement of learning and the arts.

Hastings or Senlac (Sussex, A.D. 1066).—Norman influence was strong enough in England to wring a promise of the Crown from King Edward the Confessor, and at Edward's death, William, Duke of Normandy, enforced his claim with a large army. King Harold, detained by a Norwegian invasion in the north of England, was unable to prevent the landing of the Normans, and was defeated and killed in the great battle of Senlac, which gave Duke William the Kingdom of England and the name of "The Conqueror." It should be borne in mind that the Normans were not French, but Norsemen, and closely allied to the English in blood. They had settled in Normandy in 911.

Jerusalem (Palestine, A.D. 1099).—The taking of Jerusalem marked the success of the first great religious war, or Crusade, of the Christians against the Mahometans. The Holy Land was reconquered by the Christians, and their leader, Godefroi, or Godfrey, of Boulogne, was made king of Jerusalem. The Crusades, of which there were seven in about 200 years, had a very great influence on Europe. The nobles lost, and the Church and the towns gained power, while the ignorant West learned poetry and science, commerce and civilisation, from the East.

Acre (Palestine, A.D. 1191).—This ancient seaport town was the channel by which the Christians kept up their communications with Europe. Hence it was taken and retaken several times during the Crusades. Its most memorable siege was that of 1191, when it was taken by Philip Augustus of France and Richard Cœur de Lion of England, whose troops fought side by side.

Constantinople (Turkey, A.D. 1203).—The Eastern part of the old Roman Empire had become Greek, and lingered on, growing weaker every year and gradually losing its territory. The Venetians, at that time the merchants and sailors of Europe, desired to possess the city, which was admirably situated for

commerce. They prevailed on the Crusaders to join in an attack, and sent a powerful fleet themselves under the aged Doge, "blind old Dandolo." The city was taken and held by the Venetians for 70 years, when the Greeks regained possession.

Lewes (Sussex, A.D. 1264).—This battle was won by Simon de Montfort, Earl of Leicester, and the barons of England, against King Henry III, who had repeatedly broken the charter which he had signed on his accession. He was made prisoner, and forced to grant many new privileges, among others the summoning of the first assembly which can be called a Parliament. This battle was, therefore, largely instrumental in the foundation of the English constitution and the liberties of Englishmen.

Bannockburn (near Stirling, Scotland, A.D. 1314).—The Scots had been conquered and harshly treated by Edward I of England, and they rose, under Robert Bruce, against Edward II. They met the King's army at Bannockburn, and totally defeated it, the victory being so decisive that Scotch independence was achieved at once, and Bruce became King of Scotland.

Morgarten (Switzerland, A.D. 1315).—A brilliant triumph of freedom against tyranny. The Swiss people, maddened by Austrian oppression, revolted, and 1,300 of them all but annihilated the army of Austrian knights and nobles, numbering 20,000, in a mountain pass, at Morgarten, in the Eastern Alps. On this battlefield the Swiss won the freedom which they have kept and used so well ever since.

Cressy or **Crecy** (France, A.D. 1346).—This victory was gained by Edward III of England over a French army much superior in numbers. It is noteworthy as being the first occasion on which cannon were used. The victory was barren, as Edward was forced to fight simply to cover his retreat and embarkation for England.

Poitiers (France, A.D. 1356).—A battle fought by Edward the Black Prince, son of Edward III, with the French, in which King John of France was taken prisoner. A peace, which lasted for a few years, was the result of this victory. Both these battles and the wars between France and England for more than 100 years were caused by Edward's claim to the French crown, by inheritance through his mother. The title of "King of France," then assumed by the English sovereign, was only abandoned in the present century.

Agincourt (France, A.D. 1415).—This victory opened the road to Paris for Henry V, but his marriage with the French King's daughter stopped his progress. The battle was won by a force of 15,000 against 50,000, but its results were quite insignificant.

Orleans (France, A.D. 1419).—Henry VI, taking advantage of French weakness, renewed the war, and was crowned King of France at Paris, half France being under his power. But France was delivered by the enthusiastic peasant-girl, Joan, or Jeanne d'Arc; with her success in raising the siege of Orléans began the expulsion of the English, and in a few years Calais alone remained in their hands. The consolidation of the French monarchy dates from this battle.

Constantinople (Turkey, A.D. 1453).—The long-tottering fabric of the old Roman Empire fell this year with the taking of Constantinople (the last and sole remnant of that empire) by the Turks under Mahomet II, after a siege of many months. This event marks the close of mediæval, and the commencement of modern history, for while the last political link with the classic past was broken, the scattering of Greek scholars and literary treasures incited Western Europe to study the ancient literature, and to take up the cause of progress. The invention of printing and the discovery of America made the new movement complete.

Bosworth (Leicester, A.D. 1485).—This may be called the last battle of the disastrous Civil Wars of the Roses. Henry, Earl of Richmond, the Lancastrian leader on this occasion, defeated the Yorkist King Richard III, and by marrying the heiress of the house of York, united the two houses. He ascended the throne as the first monarch of the House of Tudor, his Lancastrian blood being only on his mother's side.

Granada (Spain, A.D. 1492).—The Saracens, or Moors, had maintained themselves in the kingdom of Granada for more than 700 years, though the rising power of Spain had gradually driven the Moslems further south. In this year Ferdinand the Catholic of Castile took the capital of the Moorish kingdom, and shortly afterwards banished the last of the Moors from Spanish soil. This conquest more than compensated Christendom for the loss of Constantinople, and in the course of the next half-century the Spanish monarchy became the most powerful in Europe.

Flodden Field (Northumberland, A.D. 1513).—In this battle Lord Surrey was completely victorious, and James IV of Scotland was killed, with 10,000 of the Scottish nobility and their retainers.

Mexico (America, A.D. 1521).—The capital of the ancient empire of Mexico was taken by Hernando Cortez, a Spanish adventurer, who invaded this great empire with 500 followers. The city is situated in a lake, and was taken by assault from the causeways, and from ships built by Cortez. The Emperor, Montezuma, fell into the hands of Cortez, and was killed by the arrows of his own subjects in an attack made by them upon the Spaniards.

Pavia (Italy, A.D. 1525).—A battle in which the Spaniards, under Charles V, entirely defeated the French, under Francis I, who was taken prisoner. On this occasion the French King sent to his mother the news of his defeat in the famous message "All is lost, save honour."

Cuzco (Peru, A.D. 1533).—The chief city of the empire of the Incas was captured by another Spanish adventurer, Francis Pizarro, under circumstances of the greatest treachery and cruelty. He obtained possession of the person of Atahualpa, the Emperor, by treachery, and, having wrung as much wealth from him as was possible, he put him to death and seized upon his capital. The country became subject to Spain, from which power it revolted in 1821.

Lepanto (Greece, A.D. 1571).—This was a naval victory gained by the Imperialists, under Don John of Austria (son of Charles V), over the Turks, who lost 200 vessels and 30,000 men, besides 10,000 taken prisoners and 15,000 slaves liberated. This battle checked the aggressions of the Turks in the east of Europe.

Leyden (Holland, A.D. 1574).—One of the great sieges of history. The town was defended by the Dutch against the Spaniards in the War of Independence, which lasted 40 years, and the place was at last relieved by ships sailing over the land, the sea having been admitted, by order of the Prince of Orange, by cutting the dykes which protect Holland from the North Sea.

Antwerp (Belgium, A.D. 1584).—Another great siege of the same war, in which the Spaniards, under Alexander of Parma, were at length successful. The Dutch displayed the utmost bravery, but were at last compelled to yield to famine, for the Spaniards, by building a bridge across the Scheldt below the town, were enabled to cut off all supplies.

Spanish Armada (A.D. 1588).—This has been rightly called by Kingsley "Britain's Salamis," for England's existence depended on the result of the fight. The Invincible Armada of 130 great

ships with 30,000 men, was fitted out by Philip II of Spain for the conquest of England, the heretical power which had supported his rebel subjects, the Dutch, and rivalled the Spaniards in America. Drake destroyed a large part of it in 1587, and delayed the sailing for a year, and when at length it arrived off the English coast, it was totally destroyed by storms and by the English fleet under Lord Howard of Effingham (Drake, Frobisher, and Hawkins being among the leaders.) Its destruction was the first step towards the downfall of the great Spanish monarchy, which rose in one century to colossal power, and fell in the next into insignificance.

Ostend (Belgium, A.D. 1604).—This town was taken by the Spaniards after another memorable siege, which lasted three years, and which was one of the last important military events in the long Dutch War of Independence. The town was taken by the Spaniards, and, being in the southern provinces, remained to them after peace was concluded.

Lutzen (Germany, A.D. 1632).—This great battle terminated the first period of the religious struggle of Germany, called the "Thirty Years War" (1619-48). It was gained by the chivalrous King of Sweden, Gustavus Adolphus, who had joined the cause of the Reformed Church, and who fell on the field of battle.

Rocroi (France, A.D. 1643).—A victory gained by "the great Condé," when only 22 years of age, over a greatly superior Spanish force. It was one of the first of the long series of battles in which France was engaged for nearly a century and a half against Spain, Holland, England, and Austria.

Marston Moor (Yorkshire, A.D. 1644).—The first battle during the Parliamentary civil war which could be decidedly claimed as a victory for the Parliament. This success was mainly due to Cromwell and his "Ironsides," and it gave the future Protector, for the first time, a large influence in the direction of the war.

Naseby (Northamptonshire, A.D. 1645).—Here Cromwell dealt the decisive blow of the war, and the Royal cause was hopeless from the fatal day of Naseby. The King fled to Scotland, and the Scotch shortly after surrendered him to the Parliament as a prisoner.

Vienna (Austria, A.D. 1683).—The siege of Vienna is the last occasion on which any of the European nations have been in danger of conquest by Orientals. The Turks were compelled to raise the siege by John Sobieski, the King of Poland, who had defended

them on several previous occasions, and Europe was thus delivered for ever from the danger of falling under the Ottoman power, which had been threatening civilisation for nearly 900 years.

Sedgemoor (Somerset, A.D. 1685) was the last battle fought in England. The Duke of Monmouth, a natural son of Charles II, raised the West of England to support him against James II, who was unpopular on account of his religion and his despotic measures. The rebel army, little more than a rabble of peasantry, attempted by a night march on Sedgemoor, a few miles from Taunton, to surprise the Royal forces; but, being badly led, they became entangled in the marshes, and though they fought bravely, were utterly routed, with great loss of life. Monmouth was taken and executed for treason.

The Boyne (Ireland, A.D. 1690).—James II became more and more unpopular, and his despotic rule at last forced the nobles to invite William Prince of Orange, the son-in-law of James II and the ruler of Protestant Holland, to come to their relief. He landed (1689) at Torbay, and James II fled. Parliament soon after declared the throne vacant by this abdication, and William of Orange and his wife (James's daughter) were acknowledged as King and Queen of England. In 1690 William crossed over to Ireland to put an end to the resistance of the supporters of James II. in that country. This he did practically by the defeat of James's army at the passage of the River Boyne, three miles above Drogheda. The war, however, lingered on for another year, but it was chiefly confined to the reduction of some few towns which still held out for James II. They received no support, however, and all submitted after a short time to the new government.

La Hogue (France, A.D. 1692).—A naval victory gained by Admiral Russell over the French fleet. An alliance had been formed against the aggressive policy of Louis XIV of France, and England was drawn into it by her connection with Holland, in the person of William III.

Gibraltar (Spain, A.D. 1704).—This fortress was taken by Admiral Sir George Rooke, in the war of the Spanish succession, and has been successfully defended three times since, in 1705, 1727, and 1782, the siege on the last occasion lasting three years. Nature and art have combined to make the rock of Gibraltar the strongest fortress in Europe. It is an isolated rock standing on a narrow peninsula, inaccessible on three sides and strongly fortified, and as it commands the straits between Spain and Africa, it is the key of the Mediterranean, and an important naval station, indis-

pensable to England so long as she holds large possessions in the East. There is a garrison of 7,000 men.

Blenheim (Bavaria, A.D. 1704), **Ramillies** (A.D. 1706), **Oudenarde** (A.D. 1708), and **Malplaquet** (A.D. 1709) (All in the Netherlands).—These four names, always associated with the name of Marlborough, indicate the greatest battles of the war of the Spanish succession, commenced (A.D. 1701) by Leopold of Austria against France and Spain, the crown of the latter country having been left by the will of its King, Charles II, to the grandson of Louis XIV. of France, in violation of the claims of the house of Austria. Holland joined in the war against her bitter enemy France, and England took part in it also, first, because of her Continental connection through William III, and secondly, because of the support given by Louis XIV. to the exiled Stuarts. This coalition of England, Holland and Austria is generally called the Grand Alliance, and Marlborough was soon made Commander-in-Chief of the allied armies, on account of his brilliant success in the Netherlands. His great coadjutor was Prince Eugène, while Marshal Villars was his chief opponent among the French generals. The war was carried on in Italy, Spain, Germany, and the Netherlands, and at sea, but in spite of Marlborough's victories, it lingered on till A.D. 1713, when by the Peace of Utrecht the dispute was arranged, and the Bourbon family obtained the Spanish throne, on condition that the crowns of France and Spain should never be worn by the same person.

Pultowa or **Poltava** (Russia, A.D. 1709).—From this battle is usually dated the rise of the Empire of Russia. The patriotic Emperor Peter the Great, after travelling and studying in Germany, Holland, and England, laid the foundations of civil government and progress in his dominions, which, owing to long disunion, isolation, and continual war, had remained much less civilised than the more western nations. In order to gain a port in the Baltic sea he engaged in a war with Sweden. He met with a brilliant adversary in the young King Charles XII., and was at first unsuccessful, but the victory of Pultowa compelled Charles to fly to Turkey and opened the way for Russian development. By the peace of Nystadt, which at last closed the war in 1721, Russia gained her Baltic provinces, and St. Petersburg was founded as the capital of the new empire.

Fontenoy (Belgium, A.D. 1745).—A great battle in the war of the Austrian succession (A.D. 1740-1748), in which the allies were defeated by the French under Marshal Saxe. The war arose

from an attempt on the part of France to weaken the house of Austria. On the death of the Austrian Emperor, Charles VI., Maria Theresa, Queen of Hungary and Bohemia, and wife of Francis, Grand Duke of Tuscany, was the sole representative of the Austrian House of Hapsburg, and two other claimants for the succession arose asserting the incompetence of a female to inherit. France supported Philip of Spain, who was related to the French King. Prussia seized the opportunity to gain Silesia, and a war broke out into which England was drawn by her association with Hanover, the Kings of England being also Electors of Hanover from 1714 until the accession of Queen Victoria (1837).

Culloden (Scotland, A.D. 1746).—The grandson of James II. made a last attempt to recover the English crown in 1745, and, supported by the Highlanders and some Jacobites in England, his cause at first appeared hopeful. He advanced as far as Derby, but finding very little enthusiasm amongst the English, he retreated to Scotland, where, near Nairn, he was completely defeated and the rebellion entirely suppressed, the Pretender escaping with great difficulty to France.

Prague (Bohemia, A.D. 1757).—Frederick the Great, King of Prussia, had been successful in the war of the Austrian succession, but in the "Seven Years War" (A.D. 1756-1763) he was attacked first by Austria and France on different frontiers, and later by Russia and Sweden. Frederick displayed wonderful generalship, and the result of the war was on the whole advantageous to Prussia. England supported Frederick in consequence of the invasion of Hanover by the French, and their hostile attitude and intrigues in North America and India.

Rosbach (Germany, A.D. 1757), **Lissa** (1757), **Olmütz** (1758), **Zorndorf** (1758), **Hochkirchen** (1758), and **Torgau** (1759), were all important battles in the same war, in all of which, save Hochkirchen, the Prussians were successful, though pressed on all sides; Frederick obtained the possession of the province of Silesia by the peace of Hubersburg, which concluded the war in 1763.

Plassey (India, A.D. 1757).—There had been some petty warfare in India between the French and English during the previous war, and now the French supported the Rajah of Bengal against the British, and Calcutta was lost. Clive, being sent thither with about 18,000 men, of whom not more than 3,000 were English, defeated 50,000 of the Rajah's troops at Plassey, and gained the ascendancy in Bengal. The victory of Plassey may be regarded

as the foundation of the British Empire in the East. It was on the occasion of the taking of Calcutta that the Rajah shut up 136 British prisoners in the "Black Hole of Calcutta."

Quebec (Canada, A.D. 1759).—In the same "Seven Years War" (carried on all over the world), the final and decisive blow to French ascendancy in North America was given at the taking of Quebec. The storming of the Heights of Abraham, which commanded the French capital, very largely contributed to this, though the victory was dearly purchased by the death of the young English General Wolfe, on the battlefield.

Lexington and Bunker's Hill (Massachusetts, U.S.A., A.D. 1775).—The American colonists had long questioned the right of the English Parliament to tax them, as they were not represented in that body, and their complaints being imperiously rejected and the taxes enforced, they finally declared war. The first engagement in what proved to be the "War of Independence" was fought at Lexington, and General Gage, who was worsted, at once proclaimed martial law. Reinforcements arrived from England, and the next battle, that of Bunker's Hill, was advantageous to the English, though without substantial results, owing to the inactivity of the leaders.

Saratoga (New York, U.S.A., A.D. 1777).—The Declaration of Independence by the United States in 1776 altered the character of the war, and though the American forces were raw and ill-trained, the genius of Washington triumphed over all difficulties, and the tide speedily set against the British arms. The greatest disaster for England was the capitulation of General Burgoyne at Saratoga, with the entire British force, an event which led to the recognition of the infant Republic by France, and virtually decided the issue of the contest.

Cape St. Vincent (Portugal, A.D. 1780).—France and her dependent ally Spain, having entered into an alliance with the United States, they were now again at war with England, chiefly by sea. Hence, among other engagements, this battle was fought, in which the French and Spanish fleets under Langara were defeated by Sir John Jervis, afterwards Earl St. Vincent. Sir G. Rodney had taken twenty-two Spanish ships in the same year, and in 1782 he gained a great victory, off Martinique in the West Indies, over Count de la Grasse. The naval power of England was established by these and other victories about this time.

Yorktown (Virginia, U.S.A., A.D. 1781).—Here the American War was virtually brought to a close, by the surrender of Lord

Cornwallis to the French and Americans, and the Independence of the United States was recognised in the following year. This war, unjust in the beginning and grossly mismanaged throughout, cost England £130,000,000 of money, 50,000 men, and her American colonies, but, on the other hand; it created a great nation, by showing to the various States of the Union their community of interest, and binding them together to face a common danger.

Valmy (France, A.D. 1792).—The decisive character of this battle is determined by its results. The French Revolutionary Government, pressed on all hands by domestic war against the Royalists, and extremely insecure, was suddenly called to meet an invasion of the Prussians by which the very existence of the Republic was endangered. Dumouriez, by taking up a strong position in the Argonnes Mountains, enabled Kellermann to fight unhampered, and the victory of Valmy, ably followed up, not only cleared French soil of invaders, but became the first of that astonishing series of victorious campaigns which followed incessantly during the next twenty years. Dumouriez's victory at Jemappes, a little later, was really a result of the success at Valmy.

Toulon (France, A.D. 1794).—The siege of this city, held by the French Royalists and defended from the sea by the British fleet, afforded the first opportunity to Napoléon Bonaparte, then a colonel of artillery, to display his military genius. He recommended an entire change in the system of attack, and as this was successful, his influence may be dated from that time.

Lodi (Italy, A.D. 1796).—The passage of the bridge of Lodi in the face of a hostile army is the most striking action in the first of Napoléon's campaigns. Monte Notte, Castiglione, Arcola, Rivoli, and Mantua are other names made illustrious by his victories in the same campaign, in which he completely out-manceuvred and defeated four Austrian armies in a year and a half.

Camperdown (Dutch Coast, A.D. 1797).—This was a naval victory gained by Admiral Duncan, under circumstances of great difficulty, a mutiny having broken out just before in the squadron. The Dutch fleet, however, then acting under the influence of the French Republic, was entirely beaten and eight ships were taken.

The Pyramids (Egypt, A.D. 1798).—This battle, which has a romantic character from its locality, was gained by Napoléon over the Turks, under Murad Bey. It rendered the French masters of Egypt, of which they already held the chief town, Alexandria.

The expedition to Egypt was undertaken by the French with the hope of obtaining command of the route to India and the East, but in spite of their military successes the expedition resulted in failure.

The Nile (Egypt, A.D. 1798).—By this brilliant naval battle Nelson destroyed the French fleet and rendered nugatory the successes of the army on land. The fighting continued all night, and the entire French fleet was taken or destroyed save two vessels. Mrs. Hemans' poem "Casabianca" refers to this battle.

Seringapatam (India, A.D. 1799).—In the war with Tippoo, Sultan of Mysore, who was endeavouring to recover his hereditary kingdom, Wellington, then Col. Wellesley, took this famous "city of Vishnu," and capital of Southern India. The Sultan was killed, and his dominions were nearly all annexed to the British Empire.

Hohenlinden (Bavaria, A.D. 1800).—A victory obtained by the French under Moreau, over the Austrians, whose capital (Vienna) then lay open to the enemy. It is the subject of Campbell's spirited poem of this name.

Marengo (Italy, A.D. 1800).—This battle, gained about the same time as the last, after Napoléon had passed the Alps with his whole army, added to the previous defeat, obliged the Austrians to submit to the peace of Luneville, and in 1802 this led to the general peace of Amiens.

Alexandria (Egypt, A.D. 1801).—Napoléon's success in Europe was dimmed by the British victory at Alexandria, which led to the evacuation of Egypt by the French, but which cost the life of Sir R. Abercrombie. Many of the antiquities now in the British Museum (including the famous Rosetta stone) were at this time diverted from their original destination, Paris, to England.

The Baltic (A.D. 1801).—In the same year a new combination of Napoléon's caused the British fleet to be sent to the Baltic Sea, to hinder the closing of the Elbe and other rivers to British commerce, and Lord Nelson destroyed the Danish fleet, after a hard fight, thus preventing it from being used for the advantage of the French.

Assaye (India, A.D. 1803).—Wellington (then Col. Wellesley) took the fortress of Ahmednuggur, and at Assaye defeated the allied armies of the great Mahratta chief, Scindia, and the Rajah of Berar, amounting to 30,000 men, with a force of 5,000, and compelled the Rajah to sue for peace.

Ulm (Wurtemberg, A.D. 1805).—The peace of Amiens lasted but a short time. War had again broken out, and Napoléon's strategic genius compelled the surrender of General Mack at Ulm with 30,000 Austrian troops without firing a shot.

Trafalgar (Spain, A.D. 1805).—The greatest and last of Nelson's victories, in which the French and Spanish fleets, under Admirals Villeneuve and Gravina, were completely destroyed, 18 ships being taken, and the eleven which escaped being mere wrecks. Nelson, however, fell, pierced by a rifle bullet, and died as soon as the battle was over. This victory prevented Napoléon from carrying out his scheme of invading England.

Austerlitz (Austria, A.D. 1805).—This, the "battle of the three Emperors," was Napoléon's most decisive triumph over the united forces of Austria and Russia, led by their respective sovereigns. The victory was so complete that in three weeks followed the peace of Presburg, by which Austria surrendered 24,000 sq. miles of territory and $2\frac{3}{4}$ millions of subjects.

Jena (Prussia, A.D. 1806).—This victory laid the kingdom of Prussia at Napoléon's mercy. The Prussian fortresses fell at once, and Napoléon dictated the Berlin decrees from the capital, whereby he forbade the importation of British goods into any of the Continental ports, and forfeited all British property abroad. Prussia remained subject to France for seven years.

In 1807 Russia was attacked and so completely crippled at **Eylau** and **Friedland** that the peace of Tilsit was concluded a few days afterwards.

Copenhagen (Denmark, A.D. 1807).—The Danish fleet, secretly refitted, had, doubtless, been intended for use, by Napoléon, against England, now the only power capable of coping with him, and still unconquered. As no explanation could be obtained, an English fleet, under Admiral Gambier, and land force, under Lord Cathcart, bombarded and took Copenhagen, and compelled the surrender of the fleet, which was carried to England.

Saragossa (Spain, A.D. 1808).—In this year Napoléon invaded Spain, overthrew its feeble government, and set his own brother on the throne. The Spanish nation, however, resented this, and resisted the French armies on all sides. The most heroic defence of the Spaniards against the French was that of Saragossa, famous for the enthusiastic bravery and devotion of the women during the siege. The town fell, however, early in 1809, and was stormed house by house, no less than 20,000 citizens being killed during the storming.

Corunna (Spain, A.D. 1809).—England had sent a force to protect and assist her faithful ally, Portugal, threatened at this time by Napoléon with dismemberment and subjugation. This force, under General Sir John Moore, was insufficient to cope with the gigantic French armies, and was compelled after a time to retreat to the coast. A battle was fought to cover the embarkation, and Marshal Soult was completely defeated, but Sir John Moore fell mortally wounded. The poem on his burial is well known.

Wagram (Austria, A.D. 1809).—This was another of Napoléon's victories, in which Austrian resistance was finally crushed, and the marriage of the conqueror shortly afterwards to Maria Louisa, daughter of the Emperor, marked the completeness of the Austrian humiliation.

Talavera (1809), **Badajoz** (1812), **Salamanca** (1812), **Vittoria** (1813).—These form the chief of a long series of victories in the "Peninsular War," which, through the genius of Wellington, became the first check to Napoléon's progress and one cause of his ultimate downfall. After Corunna, a force of 25,000 men, under Wellington, was sent to defend Portugal, and the Spanish patriotic party joined themselves to the English commander. Passing the Douro, in the face of the French army, he defeated Soult, liberated Portugal, and, entering Spain, gained the battle of Talavera; but for want of support in the country, he fell back to the famous lines he had constructed at Torres Vedras for the protection of Lisbon. Massena did not attempt to force them. When he retired Wellington followed him, taking the fortresses of Ciudad Rodrigo and Badajoz, and winning the victories of Fuentes d'Onoro and Salamanca, by which he was enabled to enter Madrid in triumph, retreating again for the winter of 1812 into Portugal. Wellington re-entered Spain in 1813, and found that the French, for the first time, were not very much stronger than his own force. He drove them back beyond the Ebro, gained the famous battle of Vittoria, defeated Soult at the Pyrenees, and having cleared Spain and Portugal entered France, causing Soult to retire upon Toulouse, where another victory laid open the road to Paris. But Napoléon's abdication stopped this victorious career, and gave peace to Europe.

Smolensko, B. Borodino (Russia, A.D. 1812).—In this year Napoléon marched with half a million of men against Russia, and, carrying all before him, entered Moscow, the ancient capital, intending to winter there with his army. The city was, however, burnt by the Russians, and the French were forced through fear of

starvation to retreat in the depth of a Russian winter. Harassed by clouds of Cossacks, who hovered on its flanks, and perishing by thousands of cold, the Grand Army melted away, so that not 50,000 reached their homes in safety. This was the commencement of Napoléon's ruin.

Lutzen, Leipsic (Germany, A.D. 1813).—The success of the Russians roused the German nation, and a whole people rose to expel the invader. But Napoléon's genius was brilliantly displayed. Having created another army by conscription, he gained victory after victory, but all in vain. His forces were ultimately driven back. The British were advancing through France, while the Russians were hastening to Prussia's aid; and when these were joined by Sweden and Austria, the allied force was irresistible. The "battle of the nations" lasted three days round Leipsic, and the French were overwhelmed, with a loss of 50,000 men, while Napoléon's power received its death-stroke. The allies entered France from the East, and after some useless struggles Napoléon abdicated at Fontainebleau, in April 1814, and was exiled to the Isle of Elba, in the Mediterranean.

Quatre Bras, Waterloo (Belgium, A.D. 1815).—In March of this year, Napoléon escaped from Elba and landed in France, where he was received with enthusiasm. The Bourbons fled and the Empire was restored. The coalition of European powers of the previous year was immediately renewed, and Wellington and Blucher were placed at the head of the allied armies in the Netherlands. Napoléon was first in the field, and, after gaining some minor successes, attacked the Prussians at Ligny and compelled them to retreat, though they did so in good order. Ney's simultaneous attack on the English failed, but Wellington withdrew to join Blucher, and took up his position at Waterloo. Here he was attacked by Napoléon with 120,000 men, and gained what might have proved a barren victory, but for the timely arrival of the Prussians, which converted the French defeat into a total rout. This battle, the most important of the present century, was fought on the 18th of June, and Napoléon soon after surrendered himself to Captain Maitland, of the British ship *Bellerophon*. The brief period during which Napoléon reigned for the second time as Emperor is called "The Hundred Days."

Navarino (Greece, A.D. 1827).—Here was completed the new structure of Greek independence. For six years the revolted Greeks had carried on a heroic struggle against the Moslem, when the combined fleets of England, France, and Russia

espoused their cause. The Turks were defeated, and Greece became an independent kingdom.

Sobraon (India, A.D. 1846), **Chilianwallah** (India, A.D. 1849).—These battles were fought in the Punjab, against the Sikhs, a warlike race, which, from a religious sect, had risen to be a nation. Under their leader, Runjeet Singh, the Sikhs became the rulers of the North-West, and after 40 years of rivalry and occasional hostilities with the English, the Sikh War broke out in 1846. Much hard fighting and terrible losses ensued on both sides, until the Sikhs were subdued and their dominions annexed to the British Empire, of which the Sikhs are now most valuable and faithful subjects.

Alma, Balacava, Inkerman (Crimea, A.D. 1854).—The peace of nearly 40 years in Europe and the Great Exhibition of 1851 had led to dreams of an age of peace, which were rudely broken by the Crimean War. The Eastern Question, which had been a standing menace since 1829, led to an open rupture. The Russian Emperor Nicholas I. claimed the protectorate of all Greek Christians in Turkey, and declared that Servia, Bosnia, and Bulgaria should be independent states under Russian protection. As Turkey declined to recognise such a protectorate, the Russians crossed the Pruth and occupied the Danube provinces. France and England, and subsequently Sardinia (practically Italy), joined the Turks in resisting this aggression. The heights of Alma were carried in the face of vastly superior forces, Balacava was won, and held in spite of the fatal blunder which sent the Light Brigade to destruction in the famous but useless charge, and at Inkerman the Russians were hopelessly beaten in a heavy fog—all within one autumn, and then the war changed into the hardships and weariness of a long siege.

Sebastopol (Crimea, A.D. 1855).—This great fortress and naval arsenal was besieged and partially bombarded by the allied fleets and armies in 1854-5. After the town had been reduced to ruins, the Russian fleet sunk, and some forts taken with fearful losses, the southern side of the harbour was abandoned, and this virtually brought the war to a close.

Kars (Armenia, A.D. 1855).—The war had been waged in the East as well as in the Crimea, but Russian progress was stopped by the heroic defence of this city by the Turks and a small English force under General Williams, who, after holding out for many months, were forced to surrender through famine. General Williams had fortified the place himself, and was knighted for his valiant conduct.

Cawnpore (A.D. 1857), Lucknow (A.D. 1858, India).—The Crimean War was scarcely over when the Sepoys, or native troops in the British service in India, broke out into open mutiny (May, 1857) and committed the most hideous atrocities upon the Europeans (ladies and children especially) who fell into their power. Indignation and horror in England rose almost to fury as the details, too revolting for publication, leaked out in private correspondence. The small British force then in India was most ably used, and, by heroic exertions, the mutiny was put down, and punishment summarily inflicted almost before reinforcements could arrive. The capital, Delhi, was re-taken; General Havelock, after a long march, relieved the Residency of Lucknow, and was in turn besieged by the rebels, but he defended himself valiantly until relieved by the rapid march of Sir Colin Campbell. The administrative ability of Lord Lawrence, which kept the north-west provinces quiet, and thus released troops for active service against the mutineers, was of the greatest value, and probably averted a long and terrible war.

Magenta and Solferino (Italy, A.D. 1859).—The long-standing hostility of Italy to Austria found vent in war as soon as the aid of France was secured. The French and Piedmontese armies gained some advantages at Montebello and Palestro, and these were followed by the two victories of Magenta and Solferino, which brought about negotiations resulting in the cession of Lombardy by Austria to France and by her to Italy. This was the first great step towards the union of all Italy under Victor Emmanuel, the King of Sardinia. In this war, and subsequently in the kingdom of Naples, Garibaldi distinguished himself by his patriotic bravery and address, and Count Cavour by his statesmanship.

Bull's Run, Gettysburg, Vicksburg, Petersburg (United States, A.D. 1861-5).—The attempted secession of the Southern States of the American Union led to a long, bloody, and ruinous war, which the consummate skill of the rebel generals enabled them to prolong in the face of immensely superior forces. The Federal Government, worsted at first, gradually put forth its strength, and General Grant finally compelled General Lee to surrender with his army after the battle at Petersburg. The other Southern leaders, seeing that further bloodshed would be of no avail, followed General Lee's example, and the Union was thus restored. The slaves in the South, to the number of three and a half millions, were set free by a proclamation from President Lincoln. The war cost about one thousand millions sterling, both sides included.

Sadowa (Austria, A.D. 1866).—A quarrel concerning the duchies of Schleswig and Holstein ostensibly led to the outbreak of war between Austria and Prussia, but the real question in dispute was that of supremacy in Germany. A diversion of the Austrian forces to repel the Italians enabled the Prussian General von Moltke to advance with amazing rapidity, and the result of the decisive victory at Sadowa, on the Elbe, was a sudden proposal for peace from Austria, accompanied by the cession of Venetia to France, by whom it was immediately transferred to Italy. In a campaign of a few weeks, Prussia thus established her supremacy in the German community of nations, and Austria resigned her position as a German power, and retired from Italy.

Sedan (France, A.D. 1870).—The Franco-German war was precipitated by Napoléon, who thought to render his throne secure by satisfying the French love of glory. A quarrel respecting the succession of a prince of the house of Hohenzollern to the Spanish throne was made the pretext for commencing hostilities. The Emperor, who imagined that everything was in readiness, had been deceived, for his army was incomplete, ill-organised, and poorly equipped, while that of Germany was numerous, ably officered, and fully supplied. The result was that after the first skirmish the French were beaten in battle after battle, and the Germans invested the fortresses of the frontier line. The French generals were out-marched and out-manœuvred, and at last MacMahon was forced to capitulate at Sedan with 80,000 men, whilst the Emperor surrendered himself as a prisoner of war. This was the signal for a revolution in Paris, where the Empire was replaced by a Provisional Republican Government.

Metz—Paris (France, A.D. 1870-1).—The German armies, advancing, soon invested the capital, and the eyes of Europe were directed to Strasbourg, Metz, and Paris, on whose resistance France depended while new levies were made. These fortresses fell, however, one after the other, while all opposition in the centre and east of France was crushed, and when Paris capitulated, on 28th January, 1871, after a siege of 131 days, the war was virtually at an end, though the treaty of Versailles was not signed till February 26th. France surrendered the provinces of Alsace and Lorraine, including the fortresses of Metz and Strasbourg, and agreed to pay an indemnity of £200,000,000. On the 18th January, in the Palace of Versailles, King William of Prussia had been unanimously proclaimed Emperor of Germany by all the German sovereigns there assembled.

Plevna (Turkey, A.D. 1877).—The defence of Plevna was the most brilliant military exploit in the Russo-Turkish war of 1877-8, the little town being held by Osman Pacha for 147 days against the whole Russian force—the fortifications consisting only of earthworks and redoubts rapidly formed when the siege was imminent. This heroic defence was, however, of no avail, and the war resulted in a complete success for Russia. Turkey lost a large portion of territory and agreed to pay a heavy indemnity to the conqueror. The principalities of Bulgaria and Eastern Roumelia were created out of the ceded territory.

Ulundi (S. Africa, A.D. 1879).—The colonists of Natal having become embroiled in a war with Cetewayo, the king of the Zulu tribe, Lord Chelmsford was sent from England with Imperial troops to the seat of war. The smallness of his force and the extent of the line of operations led to the disaster of Rorke's Drift, in which 500 British fell. But this was soon revenged by the victory at Ulundi and the subsequent capture of the king and settlement of the country under different native chiefs.

Candahar (Afghanistan, A.D. 1880).—In the second Afghan war, General Burrows had suffered a defeat at Maiwand at the hands of Ayooob Khan, the claimant to the throne of Afghanistan, and had been shut up and besieged in Candahar. General Phayre was unable to move up to his relief, and General Roberts therefore started from Cabul, and after a long and rapid march through a most difficult and hostile country, arrived in time to raise the siege by obtaining a victory over Ayooob's troops on September 3rd, 1880, at Mazra.

Biographies of Great Men.

Confucius or **Kung-foo-tsze** (probably B.C. 551-478).—In the perpetual warfare of numerous petty kingdoms, the old literature of China had been forgotten, and this philosopher spent his life in inculcating the practice of virtue, and in editing *The Five Classics*, as they are called, four of which were little more than compilations from the great works of that ancient literature. His own work, the fifth, is called *Spring and Autumn Annals*. These five works form the Holy Books, or Scriptures, of the Chinese nation. No religious system was founded by Confucius, nor do his followers profess any belief concerning the future or unseen world. His teaching was purely limited to practical social morality, and is followed by most of the upper classes, while the mass of the people are Buddhists.

Buddha (probably B.C. 620-543), **Gautama**, **Siddartha**, or **Sakya Muni**, the **Buddha** (*i.e.*, the Enlightened), was a prince of India, born in Nepaul, who, after undergoing all the austerities of Brahmanism, revolted against the formalism and priestcraft of the prevailing creed. He spent his life in relieving distress, and preaching the need of a pure life and of the control of the passions. He died at Kousinagara, in Oude. After his death, his followers compiled the book of Buddhist Scriptures, the "*Tripitaka*," and the religion, in a form very different from its founder's teachings, spread over India, Ceylon, Burmah, China, Japan, and Tibet, growing more and more corrupt as it became extended. It was extirpated in India about 1,200 years ago, but is still the faith of some 470 millions of Asiatics. Its literature has recently been carefully studied by Europeans.

Socrates (B.C. 468-399) was a celebrated Athenian philosopher, the son of a sculptor. In his youth he served with honour in his country's wars, but he devoted the rest of his days to teaching simplicity of living and severity of morals. He was ridiculed and even persecuted, but his blameless life was honoured by all, and he had many disciples, the most illustrious being Plato, to whose

dialogues, in which Socrates is introduced, we owe most of our knowledge of that teacher. During the time of Athenian disorganisation, under Spartan rule, Socrates was condemned to death for teaching new views upon religion and morals, which were stated to be corrupting the youth of Athens; he consequently ended his life at the hands of the executioner by poison, as was the custom at Athens. The real cause of his condemnation, however, was political jealousy of his intrepid and independent conduct. He is said to have held his famous discourse with his friends on the immortality of the soul, entitled *Phædo*, in prison, just before his death, as reported by his illustrious disciple Plato in one of the "*Divine Dialogues*." The Socratic method of argument consists in the teacher asking a series of skilful questions, the simple unavoidable answers proving the desired point. His disciple, Plato, founded the Academic School of Philosophy.

Aristotle (B.C. 384-323), the founder of the Peripatetic school of philosophy, was the son of Nicomachus, physician to the King of Macedon. He was the pupil of Plato, and the tutor of Alexander the Great, and was also the first man who studied nature directly. His works are marvellous in their range and genius, and embrace poetry, rhetoric, metaphysics, ethics, politics, mathematics, logic, and natural history. On all the subjects just named he was the received authority, from his own time down to the close of the middle ages.

Demosthenes (B.C. 381-322) was a celebrated Athenian orator, who devoted his energies and eloquence to opposing the machinations of Philip, King of Macedon, whose rising power would, he foresaw, destroy the liberties of Greece. His oratory, though the most splendid the world has known, was powerless against Macedonian gold, and, after witnessing the conquest of his country, he poisoned himself, to avoid falling into the conqueror's hands.

Alexander the Great (B.C. 355-323) was the son of Philip, the renowned founder of the Macedonian empire, and an account of his conquests is given amongst the "*Battles*." He was vain, passionate, and inordinately ambitious, but generous to his enemies, though some acts of cruelty stain his name. He had considerable love of learning and art, and was always surrounded by poets and men of science. He died at Babylon in his 33rd year of a fever brought on by excessive indulgence at table.

Archimedes (Died B.C. 212), the greatest Greek mathematician and engineer, was employed by Hiero, King of Syracuse. He detected the alloy of the gold in Hiero's crown, by weighing it

in air and in water, and invented burning glasses, a kind of rotary steam engine, the screw which bears his name, and a glass machine representing the motion of the sun and stars. He defended Syracuse against the Romans, but was killed on its capture, while engaged in a geometrical problem, and quite unconscious of the noise around him.

Marcus Tullius Cicero (B.C. 106-43) was one of the most distinguished of Cæsar's contemporaries. He was a lawyer and orator by profession, and while Consul he saved the State by discovering the Catiline conspiracy. But his fame rests on his philosophical and oratorical writings, which are considered the finest examples of Latin style.

Gaius Julius Cæsar (B.C. 100-44).—One of the greatest men that the world has ever produced. He was a skilful orator, a lawyer, a man of letters and of science, and a consummate statesman. In addition to this, at 40 years of age he became a general, and displayed a military genius second to none in history. He conquered Gaul, invaded Britain and Germany, met and overcame his great rival Pompey, conquered Egypt and a large part of Asia Minor, and gained many victories in Spain and Africa over the Pompeian party; in short, he was the foremost man and the virtual ruler of the whole Roman empire, when he was suddenly assassinated by a band of conspirators in the Senate house at Rome, B.C. 44.

Mahomet or **Mohammed** (A.D. 570-682) was born at Mecca, and was the son of Abdallah, a collateral member of the influential tribe of the Koreish. He was until his 40th year a merchant, trading by caravan to Syria, where he became acquainted with the corrupt Christianity of the East. This worked upon a naturally fervid religious temperament, and it seems probable that he believed himself inspired when he began to preach a reformed faith. For years the Arabs, who were heathen, paid little heed to his teaching, but a persecution which caused him to flee from Mecca (A.D. 622) was the foundation of the new faith, and the Mahometan nations reckon from this *Hegira*, or flight, as a new era. Mahomet's tenets spread rapidly, and he published the *Koran*, which claims to be inspired, but is, in fact, a mixture of his special teaching with Jewish legends and history. His followers took up arms, and soon the new religion was triumphant; but its founder died in 632, before his doctrines had spread beyond Arabia. Countless legends have grown up concerning Mahomet, and many stories of his miraculous powers are current besides those contained in the *Koran*. There are about 150 millions of Mahometans in Africa, Arabia, Turkey, Persia, Central Asia and India, divided into several sects.

Charlemagne (A.D. 742-814).—In the person of this great Frankish conqueror, the Roman Empire of the West was revived, after being in abeyance more than 300 years, and the title passed to the German and thence to the Austrian Emperors, by whom it was preserved till 1806. Charlemagne enlarged the boundaries of his Empire in all directions, and was acknowledged in France, Germany, part of Austria, and Italy. He founded schools, encouraged learning and the arts, and strove to spread civilisation throughout his dominions. He entered into friendly relations with another enlightened and powerful prince, Haroun-al-Rashid, the Khalif of Bagdad and ruler of the great Mahometan empire of the East.

Alfred the Great (A.D. 849-900) was born at Wantage, in Berkshire, and was a parallel in England to Charlemagne on the Continent. He freed his kingdom from the Danes, created the British Navy, encouraged learning by founding schools, and, by translating the Latin works of his time into English, laid the foundation of English literature. He also revised and improved the laws and the administration of justice, and most thoroughly deserves the reverence paid to his memory.

Roger Bacon (A.D. 1214-1292).—This extraordinary man was educated at Oxford and Paris Universities, and became a Franciscan monk. He devoted himself to the study of chemistry and natural science, spending a large sum in his researches. His learning excited the envy of the monks, by whom he was branded as a magician assisted by evil spirits. He was, however, protected by Pope Clement IV, to whom he dedicated his great work, the *Opus Majus*. His writings are full of obscurities, but contain many marvellous discoveries, among which gunpowder and magnifying lenses are the best known. He wrote on a great variety of subjects, and is considered one of the greatest men of genius the world has ever seen.

Dante Alighieri (A.D. 1265-1321), the greatest poet of the middle ages, was both a soldier and a statesman, and in the latter capacity suffered banishment from Florence, his native city. During his exile he wrote his epic poem *The Divine Comedy*, in which is described his wandering in a vision through the three divisions of the future world. The work consists of three parts, entitled *Hell*, *Purgatory*, and *Paradise*. It was the first poem in the Italian language, and has acquired a world-wide fame.

John de Wycliffe (A.D. 1324-1384), the earliest of the English reformers, was master of Balliol College, Oxford, and afterwards Rector of Lutterworth, Leicestershire. He preached and wrote

against the corruptions of the Romish Church, and was denounced as a heretic, but, thanks to his patron John of Gaunt, he escaped. He also made a translation of the New Testament into English, and founded a reformed sect called the Lollards. His doctrines spread to the Continent and stimulated reform in several countries. He has been called "the Morning Star of the Reformation."

Geoffrey Chaucer (A.D. 1328-1400), the father of English poetry, was the son of a wealthy merchant. After receiving a University training, he travelled abroad and studied law, but finally obtained several appointments under Government. These and a pension afforded him leisure for composition. His writings are numerous, being largely composed of adaptations from the French romantic poems, but his great work, *The Canterbury Tales*, is wholly his own. Unfortunately this was left unfinished, but the fragment which we possess is sufficient to ensure the immortality of his name.

William Caxton (A.D. 1410-1491), the first English printer, was apprenticed to a mercer, but during his residence abroad as agent of the Mercers' Company he learned the new art of printing, and on his return he set up a press in the Almonry at Westminster, in 1474. The first book he issued was *The Game and Playe of the Chesse*, and this was followed by many other works in English, French, and Latin, most of those in English being translations made by himself. His press was visited by King Edward IV, and he issued more than 60 volumes in the 18 years preceding his death.

Christopher Columbus (A.D. 1445-1506) was a Genoese by birth. Having settled at Lisbon as a trader, he conceived the idea that there must be a western continent, and studied the subject as far as existing books and maps allowed. The Genoese and Portuguese Governments, on being applied to for help, refused to listen to the scheme of a dreamer, but the Spanish monarchs (Ferdinand and Isabella), perhaps from jealousy of Portuguese maritime enterprise, furnished him with three small ships, with which he set sail from Palos, August 3rd, 1492. On October 12th he landed on San Salvador, one of the Bahamas, and sailed thence to Cuba and Hispaniola. Though highly favoured at first, he was soon calumniated by his rivals at Court, and deprived of his command, being sent home in chains. He was subsequently set free and employed in further discoveries, but he again fell into disfavour and died broken-hearted in 1506.

Nicholas Copernicus (A.D. 1473-1543) was a famous Prussian astronomer, who, after studying medicine and mathematics,

became a Canon in the Church and devoted his leisure to astronomy. He published the new system of the universe which bears his name, and which, by establishing the central position of the sun and the revolution of the earth, overthrew the Ptolemaic system that had been received for 1,300 years.

Michael Angelo Buonarrotti (A.D. 1475-1564) was a man of marvellous genius, who distinguished himself as a painter, a sculptor, and an architect. He was employed by Lorenzo (the Magnificent) de Medici and by several Popes. His paintings and sculptures are sublime in their conception, and the magnificent church of St. Peter at Rome is a lasting witness to the greatness of his genius.

Martin Luther (A.D. 1483-1546).—Wycliffe, Huss, Waldo, and Savonarola had all attempted a reformation of religion, but their times were hardly ripe. Luther was the son of a Saxon miner, and after studying law and divinity, he became an Augustinian monk at Erfurt in 1505. He was soon led to see the gross corruption of the Romish Church, and an open sale of indulgences by the papal emissary, Tetzel, so roused his indignation that he published, on October 31st, 1517, 95 propositions, in which the system of indulgences was condemned. He was proclaimed a heretic but he appealed to a general Council. His writings being burned, he retaliated by burning the bull of excommunication issued against him (1520), and in the same year defended his opinions before the Diet of the whole German Empire, at Worms. He was forced to conceal himself for a time, but the Reformation had begun, and before his death, in 1546, half Germany and the Netherlands, with parts of France and England, had embraced his tenets. He was a most prolific writer on theological subjects, and an able critic. He translated the Bible into German, besides composing many hymns, several of which are still in constant use.

John Knox (A.D. 1505-1572), the Apostle of the Reformation in Scotland, was educated for the Church, but soon after his ordination he renounced the Roman faith and became the most zealous and uncompromising of the Reformers. Taken by the French in 1547, he served 19 months in the galleys, and afterwards sought refuge at Geneva, where he became the friend of Calvin. In 1569 he returned to Scotland and carried on the controversy against Catholicism until his death.

William, Prince of Orange and Nassau, or **William the Silent** (A.D. 1533-1584), took his name from a small hereditary principality near Avignon, in France. He had been the friend and confidant of the Emperor Charles V, who recognised his great

abilities. Revolting against the harsh cruelty of Philip II of Spain and Henry II of France, he became first the virtual and at length the actual leader of the Protestants in the Netherlands. He displayed the most consummate skill and address during the terrible war of Dutch Independence, when he continually wrung success out of defeats, and baffled the greatest soldiers of the age with a burgher militia. He was assassinated at Delft, by a Popish fanatic named Gerard, before the struggle was half over, and the cause of Protestantism made little further progress in the Netherlands. He was the great grandfather of William III of England.

Miguel Cervantes de Saavedra (A.D. 1547-1616), the author of *Don Quixote*, entered the navy, and lost an arm at the great battle of Lepanto (1571). He also served on land, and, being taken by some Algerian pirates, was a slave for five years. Being ransomed, he returned to Spain and followed his early literary bent. He produced several dramas, but rendered his name immortal by his burlesque romance of chivalry, *The Adventures of Don Quichote de la Mancha*. He died in poverty.

Sir Walter Raleigh (A.D. 1552-1618) was born in Devonshire, and distinguished himself as a scholar, a soldier, a statesman, a navigator, a courtier, and an author. He discovered Virginia, and was eminently successful against the Spaniards in the West Indies, and also against the Invincible Armada. He was a favourite with Queen Elizabeth, but was imprisoned by James I on very slender grounds. He wrote his *History of the World* while in confinement. Liberated on parole in 1615, he failed in an expedition to discover gold in Guiana, and was beheaded on his return without further trial or offence.

Francis Bacon (Lord Verulam, A.D. 1561-1626).—A statesman and courtier in the time of Queen Elizabeth, and the greatest of English philosophers. He was, nevertheless, convicted of accepting bribes, and was condemned to pay a fine and to forfeit his offices, though he was afterwards received into favour again. His principal works are *The Advancement of Learning*, in which he showed the obstacles in the way, and the directions in which progress was possible, and the *Novum Organum*, or new instrument, in which he propounded the inductive method of research, and thereby earned the title of the "Father of Experimental Philosophy." He also wrote a series of Essays.

Galileo Galilei (A.D. 1564-1642), a celebrated Italian astronomer, was the founder of experimental science. He invented the pendulum as a measurer of time, and also a kind of thermometer, besides making many discoveries in physics. He

also constructed the first telescope of any great value, with which he discovered some of Jupiter's moons, and that the Milky Way is a collection of stars. His assertion that the earth moved, however, gave offence to Rome (though Copernicus, himself an ecclesiastic, had asserted the same thing a century earlier with impunity), and Galileo was compelled to make a solemn recantation of his errors. The *Dialogues*, in which his views were propounded, were publicly burned.

William Shakespeare (A.D. 1564-1616), the greatest dramatic poet of the world, was born at Stratford-on-Avon, and after spending the active years of his life in London he retired to his native town, where he died, a wealthy man for the times. He was patronised by Lord Southampton at first, but his own merits as author and actor gained him a high reputation, which was, however, forgotten for about a century after his death. He wrote comedies, tragedies and historical dramas, with some fairy plays, a few poems, and a collection of exquisite sonnets. He also altered and added to many older plays. His works are admired and studied in all civilised countries, and his powers of expression and of philosophical delineation of character are unrivalled, while his profound thought, his genial humour, and his universal sympathy delight all classes of society.

Johann Kepler (A.D. 1571-1630).—A celebrated German mathematician, who deduced from the astronomical observations of Tycho Brahe the three great laws governing the planetary motions, which movements had been observed by Copernicus. These are known as "Kepler's Laws," and formed the basis and corroboration of Newton's later discoveries.

Armand du Plessis de Richelieu (A.D. 1585-1642).—A celebrated French Cardinal and statesman, who ruled France during the difficult period of the religious wars. He effectually stifled Protestantism in the country, and exalted the power of France in Europe by humbling the great house of Hapsburg or Austria. He was a liberal patron of letters and art.

Rene Descartes (A.D. 1596-1650), the founder of the Cartesian school, and the greatest of French philosophers, was educated by the Jesuits and studied medicine. He did for Europe what Bacon had previously done for England, by denying the value of authority as a criterion of truth, and by applying the method of observation and induction to the study of mental phenomena. He devoted his whole life to study, but was compelled to seek refuge from religious persecution at Stockholm,

whither Queen Christina invited him, and he died there highly honoured. It was Descartes who brought optical science within the control of mathematics.

Oliver Cromwell (A.D. 1599-1658) was the son of a gentleman of Huntingdon. He was educated at Cambridge, and lived in retirement till the Civil War broke out. He then raised a troop of horse known as the "Ironsides," who were zealous Puritans, and with these he decided the victory of Marston Moor. His military genius thus gained recognition, and after Naseby elevated him to the first rank, and as head of the army he raised his party, the Independents, to power. He was foremost in bringing about the trial and execution of Charles I, and the victories of Drogheda, Dunbar, and Worcester made him master of the three kingdoms. In 1653 he became Lord Protector of England, and in this high station his administrative abilities were eminently displayed. The state of the times compelled him to act despotically, and he frequently appears to us hypocritical from his Puritanical manners and opinions; but he was undoubtedly one of the most remarkable men in history.

John Milton (A.D. 1608-1674) was in his youth a poet and a scholar; in middle life, a statesman and political writer; and in his old age, blind, poor, and proscribed, he composed the greatest epic poem of modern times. He was born in London, of a Puritan family, and became Latin Secretary to the Commonwealth under Cromwell, in whose time he wrote a *Defence of the English People*, *Iconoclastes*, *A Plea for Unlicensed Printing*, and many other works. His chief poetical works are *Paradise Lost*, *Paradise Regained*, *Comus*, *L'Allegro*, and *Il Penseroso*. He also wrote Latin and Italian verses.

Jean Baptiste Poquelin (A.D. 1622-1673), the son of the valet de chambre and upholsterer to Louis XIII, assumed the name of **Moliere** when he adopted the dramatic profession. He formed a company of actors and travelled with them for several years. At last he was taken into the service of Louis XIV, and worked hard as an actor and author till his death. His comedies are the finest in modern literature and are studied as classics.

Sir Isaac Newton (A.D. 1642-1727) was born near Grantham, and educated at Cambridge. He showed great ability in mathematics, in which he invented several new methods. He also made many discoveries in optics, improved the telescope, and propounded the theory of colours; but his theory of the nature of light has been superseded in the present century. His

grand work, *The Principia*, published in 1687, contained his greatest discovery, that of the law of universal gravitation, which explained the phenomena of weight and falling bodies, and the planetary motions discovered by Copernicus and Kepler.

Peter the Great (A.D. 1672-1725), Emperor of Russia. At the time of his accession, Russia was almost in a state of barbarism. Peter travelled over Europe to learn the art of civilisation, which he taught to his subjects on his return. He founded the present capital, St. Petersburg, defeated the Swedes at Pultowa, and extended his dominions in all directions. By his exertions in the improvement of law, government, and education, Peter the Great made Russia one of the civilised powers of the world.

Francois Marie Arouet de Voltaire (A.D. 1694-1778) was one of the most eminent men of genius of the 18th century. He distinguished himself as a poet, dramatist, novelist, historian, and philosopher. His bitter satire, his inveterate cynicism, vanity and jealousy made him many enemies, and his works, though they were very popular at the time of their publication, show a rancour and bias which detract greatly from their value. His history of Charles XII remains, however, as a model of pure French style.

Benjamin Franklin (A.D. 1706-1790).—This great American statesman and philosopher was the son of a soap-boiler, of Boston, working in that business, and afterwards in printing offices in America and London. Having gained a reputation as an author, and as a public benefactor, he entered upon diplomatic life and represented his State (Pennsylvania), in England, in 1757. He made various discoveries in electricity, and invented the lightning conductor, in consideration of all which he was made a Fellow of the Royal Society, and honoured by degrees from Universities. He was examined in Parliament concerning the famous Stamp Act, and during the War of Independence he supported his country with characteristic patriotism. In 1778 he concluded the Treaty of Alliance with France. He was a member of the federal convention which framed the United States Constitution; he was also the friend of Washington, and died universally honoured and regretted.

Captain James Cook (A.D. 1728-1779) was born in Yorkshire in 1728. His first experience of the sea was obtained in the merchant service, in which he spent seven years. He then joined the Navy, and after some years passed in marine surveying, sailed in the "Endeavour" (1768). He observed the transit of Venus at Tahiti, and discovered the Society and other islands, sailed round New Zealand, and explored Eastern Australia. In a second

voyage he explored the Antarctic Ocean, and in a third (1776) attempted to discover a passage to the North between the Atlantic and Pacific Oceans. His attempt being baffled, he returned (1778) to winter at Hawaii, where he was killed in a quarrel with the natives (1779).

George Washington (A.D. 1732-1799), the son of an American gentleman, was born at Bridges Creek, Virginia, and was employed in early life in land surveying. He afterwards became a Major in the Colonial Militia and a Senator, and was chosen to be the leader of the Americans in the War of Independence (1775). Here his genius was pre-eminent. He virtually created the American army, and in spite of innumerable difficulties, caused by disunion and want of men, money and supplies, he was victorious on all hands. It was through his conduct of the war that America became a nation. He was elected first President of the United States in 1789, and again for a second term in 1793, and his prudent and sound administration did much to consolidate the Union which he had chiefly contributed to form. He was modest, generous, and courageous, and is honoured as a man, a citizen, and a general, fully worthy of the veneration in which his name is universally held.

Johann Wolfgang von Goethe (A.D. 1749-1832), the greatest of German poets, was born at Frankfort-on-the-Main, and studied law, but was more interested in natural science. Having gained a reputation as an author by *The Sorrows of Werther*, he was patronised by the Duke of Saxe-Weimar, who was always ready to befriend men of letters. The Duke made him director of his theatre, and also gave him a political position. Under the Duke's favour Goethe produced his great works—dramatic, poetic and romantic—the greatest of them all being, undoubtedly, *Faust*, in which philosophical and partly allegorical poem the thought and experience of the poet's life are concentrated.

Horatio Viscount Nelson (A.D. 1758-1805), the greatest of English Admirals, was the son of a clergyman in Norfolk, and rose to the rank of Post-Captain in 1779. He took a prominent part in the battle of Cape St. Vincent. At Calvi he lost an eye, and at Teneriffe his right arm. When he returned home in 1796, he had been in action 120 times, and had captured 17 ships of war and 50 merchant vessels. His subsequent victories and his death in the hour of victory at Trafalgar are related in the sketch of great battles.

Robert Burns (A.D. 1759-1796), the Ayrshire ploughman and poet, was oppressed by poverty and misfortune all his life, and when the genius shown in his poetical works gained him entrance into the best literary society of the Scottish capital, but failed to bring any solid recognition, he gave way to intemperance, and, though continuing to write for some time, died at the early age of 36. His poems, from their natural simplicity and truth, form an epoch in the history of poetry.

Napoleon Buonaparte (A.D. 1769-1821) was the son of a civilian in Corsica. He entered the French army at the age of 17, but first made himself conspicuous in 1794 at the siege of Toulon. His military exploits have been enumerated under the head of "Battles." The fame and influence thus acquired made him the head of a powerful party, and enabled him to overthrow the French Directory in 1799. He then became nominally First Consul, but in reality absolute ruler. His Austrian campaigns so increased his power that he was proclaimed Emperor in 1804. He bestowed crowns upon all his brothers, and some of his generals, and seemed likely to become the despot of Europe, for after Prussia's disasters in 1807, only Russia, Sweden, and England were able to oppose him. But the obstinate resistance of Portugal and Spain, 1807-13, under Wellington, the disasters in Russia (1812), and the rising of Germany (1813) at last overpowered him, and he abdicated at Fontainebleau in 1814. Returning in 1815, he re-established the Empire during "The Hundred Days," but after Waterloo he was sent to the island of St. Helena as a prisoner, and died there six years later.

Arthur Wellesley, Duke of Wellington (A.D. 1769-1852) was the third son of the Earl of Mornington, and was born at Dangan Castle, Meath, Ireland. He entered the army in 1787, and in 1794 commenced active service in the Netherlands, with the rank of Lieutenant-Colonel. He subsequently went to India, where he first distinguished himself. His services there, in the Peninsular, and at Waterloo are mentioned amongst the "Battles." After the peace of 1815 his career was political. He was twice Secretary of State, became Prime Minister in 1827, and remained till his death the Conservative leader in the House of Lords, and the Commander-in-Chief of the forces.

Alexander Baron von Humboldt (A.D. 1769-1859) was born at Berlin. He studied science and travelled in Germany, France, and England until in 1799 he commenced his first great journey with Bonpland, a French botanist. They went through South and Central America during five years of adventurous study of nature,

and the results were given in a work which it took Humboldt nearly 20 years to prepare and carry through the press. In 1829 he visited Central Asia, at the request of the Emperor of Russia. From 1845 to 1851 gradually appeared his great work, "*Kosmos, or a Physical Description of the Universe*," in which the accumulated scientific knowledge acquired during his long life was given to the world.

Sir Walter Scott (A.D. 1771-1832) was the son of a Scotch lawyer, and, after serving in his father's office, he was called to the bar, and obtained an appointment which rendered him independent. He then turned his attention to literature, first as a poet, and the popularity of his poems was only eclipsed by that of his novels, beginning with "*Waverley*" in 1814. His success, and consequent wealth, led him into much display, and the failure of a firm of publishers with which he was connected left him with a debt of nearly £150,000. The rest of his life was devoted to literary work to liquidate this sum, but over-exertion shortened his days, and he died before completing the payment.

George Stephenson (A.D. 1781-1848).—While Napoléon was revolutionising Europe for the time, Stephenson was maturing his locomotive, destined far more deeply, and in a permanent manner, to revolutionise the world. Stephenson was the son of a colliery fireman and was born at Wylam, Northumberland. Through his mechanical genius and perseverance, he raised himself by successive steps to the post of engineer to the colliery. In the year 1814 he designed and constructed his first successful locomotive, and went on continually improving his engine until in 1825 he was chosen as engineer of the Stockton and Darlington Railway—then just completed—and he supplied the locomotives to work the line. He was next employed by the Liverpool and Manchester Railway Company, for whom he fought the battle of the locomotive in Parliament, and gained the prize with his "*Rocket*" engine in 1830, when the railway was opened. From this time till his death he was engaged in railway works in England, Belgium, and Spain.

Henry Wadsworth Longfellow (A.D. 1807-1882) was born at Portland, Maine (U.S.), and was educated at Bowdoin College, Brunswick, taking his degree of B.A. in 1825. Having accepted the post of Professor of Modern Languages in the same college, he travelled for three and a-half years in England, France, Germany, Spain, Italy, and Holland, and he spent another year later in Denmark, Sweden, and Germany, studying in every case the language and literature of the country in which he was resid-

ing. No better training could be imagined for a poet, and the result is evident in the cosmopolitan spirit of his poetry. He is the poet of humanity, and not of a country. In 1836 he succeeded to the Professorship of Modern Languages and Literature at Harvard College, Cambridge (U.S.), which post he held until 1854, and has since lived in retirement, though always in literary activity. A translation of Dante and fugitive pieces from nearly all modern literatures prove the range of his poetic sympathies. The *Song of Hiawatha* tells us of Red Indian mythology, while in *Evangeline* he touches the chord of patriotism, and paints the beauty of his native land with characteristic truth. These two poems, with those on slavery, make him essentially the national poet of America; but it is his smaller and homelier poems which have become household words in England as well as in America. It is such poems as *The Psalm of Life*, *The Village Blacksmith*, *The Light of Stars*, *Excelsior*, *The Bridge*, and *The Reaper and the Flowers*, which will make their author's

"Footprints on the sands of Time."

Count Camillo Benso di Cavour (A.D. 1809-1861).—This celebrated Italian statesman was born at Turin, and first gained influence as a liberal journalist; but, devoting himself to politics, he rose to become, in 1852, Prime Minister of the kingdom of Sardinia. At this statesman's suggestion, the King of Sardinia joined England and France in the Crimean War, and thus gained influence in Italy at the expense of Austria. Jealousy grew strong between the two powers, and in 1859 Sardinia, aided by France, declared war, and the victories of Magenta and Solferino were achieved. The results of this war were the withdrawal of Austria and the ultimate union of Italy, of which Victor Emmanuel was proclaimed king. Cavour was the leading diplomatist throughout the successive negotiations, and he is justly regarded as the founder of Italian independence.

Abraham Lincoln (A.D. 1809-1865), the sixteenth President of the United States, was born in Kentucky, and after being engaged in trade and serving as a volunteer against the Indians, studied law and became a land surveyor. Elected first to the State Legislature of Illinois, he afterwards became a member of Congress, a Senator, and, finally, in 1861, was elected President. Throughout his career he had consistently opposed slavery, and, therefore, readily undertook the task of crushing the rebels in the slave-holding States. The great war between the North and the South was begun and victoriously ended during his tenure of office, but he was assassinated in Ford's Theatre, at Washington,

on April 14th, 1865. His name is recorded in history as the liberator of the slaves, while his private character and political integrity command universal veneration.

David Livingstone (A.D. 1817-1873) was the son of a tea-dealer "too honest to become a wealthy man," and was born at Blantyre. He educated himself while employed at a cotton mill, and went to Natal as a missionary in 1840. He studied the habits of the natives as well as their languages, and crossed Africa twice near the tropic of Capricorn. His next great journey was from the Cape to the west coast in Lat. 10° S., and turning thence eastwards, he explored the Zambesi to its mouth on the east coast. He came back to England in 1856, and again in 1864, but started for the interior of Africa once more in 1865, and was occupied in geographical explorations in Equatorial and Southern Africa until his death, in that country, in 1873.



The Great Inventions

AND THEIR

Effects on the World's Progress.

Gunpowder (R. Bacon, 1270).—There is a rival claimant of the honour of this invention, but it seems clear that in point of date Roger Bacon has the priority, though, owing to the obscurity of his language and the allegorical style of his work, the invention remained almost unknown, until a German monk, Berthold Schwarz, gave it a more popular form. This invention has helped, perhaps, as much as any other to civilise mankind. Before it was known Europe was in a state of perpetual war, for every family feud among the nobles, as well as dynastic or national quarrel, was settled by war. In this warfare the mounted and mail-clad nobles had an immense advantage, and could display to their followers their personal strength and courage, and the skill derived from life-long practice in the use of weapons; but by the invention of gunpowder the foot-soldier armed with arquebuss or musketoon was more than a match for the knight, whose plate armour was little better protection against bullets than the leather jerkin of the burgher. Battles ceased to be a series of single combats, and victory became more and more the result of the skilful manœuvring of large masses of men, so that discipline took the place of personal dexterity and bravery, and armies were formed of professional paid soldiers, who were led by generals specially skilled in the science of war, and to these henceforth the defence of the nation or city was committed. Instead of every citizen learning the use of pike and bow, and being liable to service in case of attack, the bulk of the people were free to follow their business without distraction, as the paid soldiers (the word means those who were *paid* as distinct from the old feudal militia) were always ready to act, and hence attacks from neighbouring nobles became less frequent. Standing armies gave, too, the chief power to the central government, and put an end to private wars.

Mariner's Compass (Amalfians, 14th century).—This invention, like gunpowder and printing, was known to the Chinese long before it was dreamed of in Europe. Indeed, it is possible that some knowledge of the instrument was brought to Europe by the traveller Marco Polo, who visited China (then called Cathay) at the close of the 13th century. Tradition ascribes its invention to Flavio Gioja, an Amalfian, but the individual is uncertain, though it is clear that the compass was first used by the sailors of Amalfi, then a rival of Venice and Genoa. As long as a ship could only be steered by the stars, which might be obscured by clouds for days together, mariners hardly dared to lose sight of land, and hence navigation as a science was unknown. Vessels were nearly always steered by sight and not by reckoning, and hence commerce was unsafe and chiefly confined to coasting trade, while three-fourths of the world remained quite unknown. Within a century after the invention of the compass, the Portuguese had pushed to Madeira, and soon, under Prince Henry the Navigator, began the series of explorations which led to the discovery of America (1492) and the voyage of Vasco di Gama to India (1497). From this time commerce altered its channels; Venice and Genoa declined, and Spain, Holland, and England became in turn the chief trading nations, and the masters of the ocean highways.

Paper (1417) and Printing (Gutenberg, 1444).—These two inventions came almost simultaneously, and have materially aided each other. The course of history and civilisation has been changed, and the modern world dates from these inventions. Civilisation and progress depend upon the record and accumulation of experience and the diffusion of books, and the freedom of the press has multiplied knowledge everywhere, giving man greater power over the forces of nature, and hence the progress of civilisation has been made much more rapid and complete than before, and the comforts and securities of life have been immensely increased. This progress, too, has been assured, and there is now no possibility of a relapse into semi-barbarism by the loss of arts and sciences, learning and history, as was the case in the dark ages. Tyranny is also rendered more and more impossible, and injustice or cruelty is at once exposed.

Steam Engine (Watt, 1769).—The giant power made available by this invention has taken the hardest work of the world off human shoulders, and has multiplied many times the power of producing wealth, and prepared the way for railway and steam navigation, which make the wealth created available in all parts of the world. The Marquis of Worcester wrote, during confinement

in the Tower (1663), a book in which he describes a "Fire Water work," which was used at Vauxhall in 1656. About 40 years later Captain Savary, a Frenchman, constructed an engine which was used in Cornish mines. In both these the steam acted directly on the water and was quickly chilled and condensed. Dr. Papin, another Frenchman, first introduced a piston between the steam and the water, and then, in 1700, used two separate vessels, answering to a boiler in which steam was generated, and a cylinder in which it did its work. About 1705 the **Atmospheric Engine** was invented by Newcomen, Cawley, and Savary, and this was in use until Watt's time. The steam was here used to raise a piston in a cylinder, and then, being condensed, caused a partial vacuum so that the piston was forced down again by the pressure of the atmosphere above, and hence the name of the engine. The piston was connected by a beam with pump rods, &c. James Watt, however, first made the engine of real value. He condensed the steam in a separate vessel, and so saved the loss of steam by chilling the cylinder at each stroke, and first applied steam to both sides of the piston, so that the whole stroke was performed by steam power. He also introduced other improvements, and is regarded as the inventor of the steam engine in its modern form.

The Cotton Gin (Whitney, 1790).—This is a machine for separating the seeds from the cotton, without which process it cannot be spun. This was formerly done by a tedious hand process, and the invention of the Gin exercised a great influence upon the production of cotton, hence upon the number of slaver employed in its cultivation, and thus indirectly led to that great social problem in the history of the United States, solved at last by a stroke of the pen from Abraham Lincoln. On the other hand, it has, by increasing the supply of raw material at a cheap rate, wonderfully affected the growth of the cotton-spinning industries in England, and through these the commerce of the world.

Spinning Jenny (Hargreaves, 1767).—This machine substituted upright spindles and a horizontal wheel for the old vertical wheel and single spindle. By this means many spindles could be used at one time, and the output of yarn was thereby greatly increased.

Roller Spinning was the method employed by Arkwright, whose yarn was known as *Water-twist*, from his driving his machinery by water power. Closely connected with this machine is the **Mule Jenny** of Crompton, introduced in 1775, so called by the operatives because it was a hybrid, in which Hargreaves' and Arkwright's inventions were combined. By means of these

machines the supply of yarn was made equal to the demand of the weavers, especially when the steam engine lent its aid.

This increase in the supply of spun-yarn led to the **Power Loom**, first constructed by William Horrocks, of Stockport, which did for weaving what the earlier inventions had done for spinning. In 1697 the import of cotton was 2,000,000 lb.; the present annual import is 1,200 millions of pounds, which employs about 450,000 operatives, and the value of the manufactured goods exported amounts to about £70,000,000, exclusive of the home consumption.

Locomotive (Stephenson, 1814).—The railway owes the greater part of its usefulness to the locomotive, which is infinitely more convenient than any stationary engine. Though many engines had been constructed, the first practical success was that of Stevenson's engine in 1814. But the real triumph of the locomotive was in 1830, when the "Rocket," constructed by Stephenson, gained the prize offered by the Liverpool and Manchester Railway Company, and, by travelling at 35 miles per hour, established its superiority to all other kinds of engine. The main features which led to this success were the successive adoption of smooth wheels and rails in place of cogged ones, the steam-blast, direct action of connecting-rod upon the wheels, and the multi-tubular boiler. The immense advantages of the locomotive are now obvious to all, and it is difficult to imagine the opposition aroused by it when first proposed. It was ridiculed in Parliament on the passing of the Bill for the Liverpool and Manchester Railway by the greatest engineers, who said it would be unable to start against the wind, and would be upset by cattle straying on to the line. The directors would not allow Stephenson to speak of any higher speed than 8 or 10 miles an hour. Then it was said that it would set fire to houses, ricks, barns, &c., near the line, frighten horses, kill the birds, poison the air; and its opponents consoled themselves by thinking that its frequent explosions would keep the public from trusting themselves behind it. Even after the opening and successful working of the Liverpool and Manchester line, corporations and landowners, farmers and inn-keepers joined in opposing, by every means in their power, the progress of the railway surveyors, so that Stephenson often met with armed resistance, and could only complete his surveys by stealth, by night, or during church time. We now know how groundless this opposition was, and many towns now regret the isolation to which they doomed themselves by forcing a main line of railway to deviate from their neighbourhood. There are now

18,000 miles of line open in the United Kingdom, with a capital of 728 millions, and an annual income of 32 millions. Great as the good already done has been, we have probably seen but a small proportion of the effects of the railway system in developing the resources of distant countries, and in civilising the world by breaking down the barriers of isolation and prejudice.

Steam Navigation (Fulton, 1802).—Mr. Patrick Miller first used a small boat propelled by steam on a Scotch lake, and several others were engaged upon the subject. Robert Fulton, however, an American, gave steam navigation its first impulse by the construction of the *Clermont*, of 160 tons, on the Hudson River, which steamed 110 miles in 24 hours. The *Savannah* crossed the Atlantic in 1819 from New York, though she sailed a great part of the way. The first genuine steam voyage across was in 1838, when the *Great Western* and *Sirius* crossed in 15 and 18 days respectively. These vessels were all paddle-steamers, but, save for river traffic, the screw-propeller has now practically superseded the paddle-wheel, as being less liable to injury in storms and allowing the ship to sail also without serious hindrance. It is also a more effective propeller. Regular steamship communication was first established with America by the Cunard Company, and with the East by the Peninsular and Oriental Company in 1840.

Electric Telegraph (Wheatstone, 1836).—The idea of using electricity for communication had been known for half-a-century, but it was not till the discovery of magneto-electricity that any practical result accrued. Professor Wheatstone's researches made the application to telegraphy possible, and, in conjunction with Mr. Cook, who supplied the practical and constructive knowledge necessary, the idea was realised and a patent taken out in May, 1837. The first public trial in England was on the Great Western Railway from London to West Drayton. Alexander, S. F. B. Morse (1844), and Steinheil are also entitled to the honour of independently inventing a practical electric telegraph, but Wheatstone's was first in point of time. There are now over 100,000 miles of wire in operation in the United Kingdom, and 30 millions of messages pass per annum.

Heraldry.

The wearing of some device or carrying of some emblem in war is an almost universal and exceedingly ancient custom. Savages tattoo their bodies; the Israelites in the wilderness were ranged in camps, each under its own standard. The Greeks had devices of various kinds on shields and helmets, and they speak of the Eagle emblem of the Medes. The Roman armies marched under elaborate standards crowned with the eagle.

But the universal practice of modern times grew out of the real needs of mediæval warfare, especially in consequence of the Crusades, where many nations mingled and fought together without really knowing each other, and ignorant of each other's language. Moreover, in warfare and in tournaments the combatants carried their vizors down, and could thus be known only by the "blazonry" of the device upon their shields and the crest upon their helmets. The number and variety of the devices made a considerable study necessary to distinguish them, and thus grew up the science of heraldry—and a herald was a needful and hence important attendant at all ceremonies. A curious system of describing the various emblems and their arrangement was developed, and a still more curious language was employed, founded chiefly on French, then the most prevalent language, as France was the especial home of chivalry. The heralds were highly honoured and formed into colleges, where the science was studied. We have still surviving in England a Heralds' College, consisting of three Kings of Arms, six heralds, and four pursuivants, busied in researches concerning the genealogies of great families, questions of inheritance, &c., and in attendance at great state ceremonies.

The COAT OF ARMS was literally at one time an embroidered garment worn over the armour, called, in the case of a herald, the *tabard*, but the arms were represented as blazoned upon a shield, whose "field" of particular "tinctures" was said to be "charged" or "partitioned" &c., according to the special circumstances. These emblems passed into international use, and Richard I used arms on the Great Seal of England.

The **HELMET**, **CREST**, and **CAP**, or **CORONET**, were placed over the shield and motto below. A later addition gave the shield supporters on either side. The Royal Arms of England has all these appendages. After the battle of Agincourt (1415) none were allowed to use arms save by inheritance or by special license, and a penalty is still attached to this offence, but the granting of these licenses is now a source of public revenue.

The Arms gradually gave place to Flags in modern times, as the use of armour died out, and the need was no longer a distinguishing mark for individuals, but a rallying mark for large bodies.

The knights had borne square pennons on their lances, and young knights carried swallow-tailed pennons, whence they were called knights-banneret, and large banners were carried before them on festal occasions, and generally the heraldic devices on shields passed on to the standards or flags. Thus may be explained the emblems of European flags, and especially the British Royal Standard, in which are blended the arms of the three kingdoms. Nations of modern growth have adopted emblems typical of their history, position, or productions, as the Stars and Stripes of the United States, the Llama of Peru, the Crescent of Turkey.

The Union Jack is a blending of the crosses of St. George and St. Andrew, and was used after the union of England and Scotland (1707). Regiments have also their especial flag or colours.



Coins and Currency.

Money is only valuable or desirable for what it will purchase. It is a common fallacy to suppose that it is in itself wealth; but, except to the miser, it would be valueless if its possessor were isolated and out of reach of those goods or pleasures for which money can be exchanged. The real wealth is the thing purchased for use, so that the prosperity of a nation is measured by the goods it buys, viz., its imports, and not by the money flowing into or out of the country. The richer the nation the larger will be its imports, and the excess of these over exports is a measure of its wealth abroad.

In primitive societies exchange of commodities is one of the earliest necessities, and is at first carried on directly by barter. But this is soon found to be awkward and inconvenient, and hence arises the need of some medium of exchange, and this is money, no matter what its nature may be. Corn is frequently used, and cattle are still employed in many localities, but gradually these are found to be also inconvenient, and so a currency comes into use as the most convenient means of effecting exchanges. The need and use of money is thus evidently universal, and many things have been used for the purpose. Shells, beans, gold dust, iron, and brass have been, and still are, employed among semi-civilised nations, but gold and silver have been gradually adopted by the civilised world, because they best answer the requirements of a currency. These requisites are:—

1. A real value, manifested by a permanent demand.
2. Absence of large or sudden changes of value.
3. Durability, to preserve it against loss and injury.
4. Portability, and convenience.
5. Divisibility, for circulation.

The precious metal gold has all these qualities in an eminent degree, and is now almost universally used as a standard of value between nations. Its high value renders its minute division inconvenient, because of the liability of small coins to loss, and therefore for small values silver is used.

Some nations have a silver standard, owing to long custom, or to special facilities for obtaining that metal, but international commerce, which is the freest from control by local circumstances, is universally carried on by gold standards.

Silver is subject to considerable fluctuations in price, owing to its supply being greater than that of gold, and hence difficulties arise in regard to the relative values of the two metals. Thus the sovereign is worth 20s. to-day; but if silver should fall in price, the sovereign might become worth say 22s., and then, as it could be bought at the bank for 20s., the temptation would be to buy coin, melt it, and sell the sovereign as gold for 22s., and this is actually done if there is any appreciable difference in the standard and market values. Silver has fallen in value relatively to gold during many years. The present relation of the two metals is about as 1 to 15.

The precious metals may, however, be reduced in value by mixing copper, lead, tin, &c., with them, and hence the custom grew up at an early date of stamping the bars or ingots of metal with a Government mark to guarantee their purity; and this stamping was extended to coins when they were introduced. But this system tempted Kings and Governments to make profit by issuing coin with the Government mark upon it, but of inferior purity and value, and this debasement of the coinage has been frequently committed in the past by almost all Governments. Its effect is the same as raising a tax from the people of the amount gained, for, though they may agree among themselves to let the base coin pass at its nominal value, foreigners will require to be paid for their goods in pure silver or gold, and hence the price in the debased coins will be increased by the difference between their nominal and real values.

Before coins were used it was customary to break the ingots into pieces for circulation, and it was the inaccuracy and inconvenience of these pieces that led to the coinage of money. But the habit of breaking remained, and the coins themselves were very frequently broken in half for small change. Thus our half-sovereign and half crown, among others, were once literally the halves of larger coins, and legislation was necessary to stop this practice. Sometimes a hole has been left in the middle of the coin, especially when the metal was a heavy one, so that they might be strung together for convenience.

As population increases and the demand for gold therefore grows, the price of gold rises, and so it purchases more, *i.e.*, the prices for general commodities fall; but when a fresh discovery of gold is made and a new supply opened, the reverse is the

case. Thus after the discovery of the Victorian gold fields about 1850, the purchasing power of the sovereign grew less, owing to the fall in the value of gold, and hence there has been a general rise in prices since that time. At present the tendency is again in the other direction, for the increasing demand for gold is greater than the present supply.

Paper Money.—There is probably, in the earliest societies, a certain amount of exchange carried on by means of promises to pay, and as confidence between men increases with the progress of civilisation, business is done more and more in this convenient way. Hence grows up a *paper currency of promises* by the side of the actual metallic currency of cash, and this tends continually to increase, but can only circulate so long as the ability to convert the paper promises into gold at any time is undoubted. Bank notes, cheques, exchequer bills, and bills of exchange are the common forms of this currency, but a bank, a government, or a merchant, must always keep a reserve to meet the promises to pay which have been issued. The bank usually keeps its reserve in gold, and the merchant in goods, while the Government can only circulate its bills if its credit be good, *i.e.*, so long as men feel sure that it can obtain money from its subjects by taxes, &c., when the time comes to redeem its promises. A paper currency is thus a necessity, especially as the area of commerce widens, for it facilitates trade between distant countries by reason of its extreme portability. It is also a convenience, for as countries buy from as well as sell to their neighbours, the continual carriage to and fro of large amounts of gold is avoided by sending paper promises to pay, and then exchanging these and sending only the difference or balance due. This adjustment of international commerce is generally managed by bankers and bill-brokers.



The Human Race.

PHYSICAL CHARACTERISTICS.

Man in his physical organisation belongs to the highest order of the Mammalian class of animals, having a vertebral column or backbone, and in every detail of structure manifests the closest affinities with the higher animals.

His food and its digestion, his blood and its circulation, his respiration, nervous system, and passions, and his mode of growth are the same as those of the animals which stand highest in organisation.

The chief marks which physically distinguish man from the higher animals are his erect gait, large brain, regular features, and range of voice, but he is raised far above them by his moral perceptions and intellectual powers, of which the higher animals display but the merest rudiments. Of all these powers probably the faculty of speech is the most important, resulting, as it does, in that accumulation of knowledge which constitutes civilisation, by making the hard-won experience of one generation the inheritance of the next. The civilised man has from this accumulated inheritance of knowledge and experience acquired feelings, perceptions, powers, and habits of mind, of which the savage has no idea, and which have raised the civilised far above the uncivilised races. For instance, few savages can count beyond twenty, and they are almost destitute of foresight, making but little, if any, provision for the future.

But in their physical frames the races of men are almost identical. All the important bones, organs, and muscles are absolutely the same, differing only in size, and very slightly in shape, among the different races, while all are subject to the same diseases and are affected by the same poisons.

The chief differences are comparatively trivial. Those usually recognised are as follows, in the order of their importance :—

Colour of skin, structure and arrangement of hair, shape of skull, and size of same relatively to the body, stature, features of face—such as colour of eyes, thickness of lips, prominence of nose, eye-brows, and cheekbones—form of foot, and length of arm. All these

variations are confined, however, within very narrow limits, and it is therefore usually believed that man forms only one true species, the existing varieties having been produced by climate, food, habits, and intermarriage acting upon a natural tendency to vary indefinitely.

It seems tolerably well established that there are only three primary divisions of the human family—the white, the yellow, and the black, though it is convenient to divide the white race into two groups, the dark whites and the fair whites. The minor varieties have arisen from intermarriage during a long period in the past. Besides the mingling of the three great varieties, the minor races have been intermixed in almost every degree, and at the present time it is not easy to find a pure race upon the globe. Perhaps the Brahmans of India and the Jews are those which can boast the least intermixture with alien races.

DISTRIBUTION.

Whatever their origin, the varieties of the human race now occupy regions immensely distant from their points of departure, for we cannot imagine that man in his primitive state, with his body quite unprotected, could have spread far north and south, the defence of warm clothing being almost a necessity against the severity of winter, even in temperate regions. Moreover they occupy oceanic islands quite isolated from one another, so that it becomes interesting to investigate the means and causes of their distribution over the globe.

The races of men are like animals and plants in being limited to definite provinces, although civilisation has recently enabled them to overstep these natural limits. Thus the black race is not found in Europe or America, the white race was unknown in Polynesia, Africa, America, and Australia, and the Mongols were not found in Africa or Europe at the dawn of history; but still, though the races are thus limited, the species is unique in its distribution in all latitudes and on every continent.

MEANS.—To find the means and the causes of this wide dispersion we must turn to the animal and vegetable worlds, and we find there that the range of species is determined on continents by climate, the abundance or scarcity of food, the presence of hostile animals, and the occurrence of natural barriers, such as mountain chains, great rivers, or arms of the sea, while on islands it depends chiefly upon the direction of the ocean currents and the prevailing winds by means of which transport from the mainland may be effected.

Upon continents man's intellectual power has rendered him almost entirely independent of climate, food, enemies, and natural barriers by giving him clothes, tools, and weapons, so that he spreads readily into remote districts; but on islands he is almost as dependent upon natural causes as the plants themselves. Thus the Mongolian race has spread gradually from the Indian Archipelago

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“On from island unto island at the gateways of the day,” •

in a northerly and easterly direction, until it has occupied most of the Pacific islands, and, by means of the Japanese current, has reached the coasts of America. Among the more civilised tribes poetical songs and traditions speak of their migrations, often as adventurers or exiles, but more frequently by accidental storms. Here the currents and winds were favourable, and the islands numerous; but it is believed that no human foot ever trod the shores of Madeira, St. Helena, Tristan d'Acunha, and other remote islands until a ship brought the civilised navigator.

CAUSES.—The causes of this migration are not far to seek. Early communities subsist chiefly by hunting and fishing, and the supply of food in any district is thus very limited. When, therefore, the tribe increases, it must ever push further afield in order to follow the game on which it subsists. Again, in later times, the pastoral state succeeds that of the hunter, and, as the flocks and herds increase in number, it becomes necessary to migrate to find new or additional pasturage; while among more civilised nations, commerce, the pressure of population, the hope of fortune, political quarrels, and many other causes combine to drive men forth into the remotest regions.

It seems also to be a law, analogous to that of natural selection among animals and plants, that the savage races die out when brought into contact with nations that are civilised, and thus rendered the more vigorous and independent of natural influences. Thus the West Indian islanders, the Mexicans and Peruvians, and the Tasmanians are extinct, and the Maoris, the Australians, and the American Indians are dying out before, or rather beside, the Europeans.

Just as these races are dying out, so new varieties are being formed by the influences of climate and by intermarriage. A large part of the population of Mexico and South America is a mixed race, sprung from the union of the Spanish conquerors with the Indian natives, during the last 350 years. In South Africa some intermixture of the white colonists with the black natives has taken place, and a mixed race is growing up. In North America, too,

a very slight mingling of the Anglo-Saxon settlers (now the Americans) with the negro slaves has taken place, and the consequence is the existence of mulattoes, quadroons, and creoles, and, on the other hand, a few districts contain half-breeds resulting from the intermixture of the Americans with the native Indian races. In the East Indies there have been some intermarriages of the English with the native Hindus, and a mixed race of half-castes is the result. The Turks, too, originally pure Mongolians, have been largely modified by the intermixture of white blood, owing to the continual selection of Greek, Circassian and Georgian wives on account of their beauty.

The same process has gone on in the past, and we may instance as an example the English people, which is the result of the intermixture of at least six different races:—

1. An aboriginal people allied to the Basques of the Pyrenees, short and dark.
2. Kelts, the tall, dark Welsh and Cornish.
3. Belgæ, the fair-haired warriors of Northern Gaul and Britain who fought against Cæsar.
4. Romans, belonging to the dark whites.
5. Saxons, from the lower Elbe and Weser.
6. Danes and Norsemen, from Scandinavia and Normandy.

Besides these we have had large additions of Flemish, Dutch, Swiss, and French emigrants, driven to England for an asylum.

The English race shows further modifications in the United States and Australia, where the climate has already caused a noticeable divergence from its typical features. So, too, the negro of the cotton-plantations is slightly different from the negro of Western Africa. In the same way the long enjoyment of civilisation has produced, and is still producing, changes in the mental organisation of races, so that the European child is by nature more tractable and teachable than the savage. He has inherited some of the effects of the long-continued civilisation of his race, and at an early age leaves the savage far behind, even when the children are educated together. The savage, however, retains acuteness of sight, smell, and hearing, accuracy of aim, cunning, and powers of speed and endurance superior to those of the European.

THE CAUCASIAN OR WHITE RACE.—This race is found by the evidence of language and common traditions to have had its early home in Central Asia.

The SEMITIC family migrated at a date antecedent to all tradition, but their arrival in Syria and Phœnicia is known to have occurred about 2,000 B.C., and they gradually spread into the Euphrates Valley, Syria, Asia Minor, Arabia, and North

Africa, where they still remain. The Jews have been scattered since the fall of Jerusalem (70 A.D.), and the Arabs occupied North Africa as far as the Atlantic and Southern Spain in the 7th and 8th centuries, but were driven out of the latter country in the 16th century. Their influence is, however, still perceptible there as well as in Sicily and some of the islands further east, and there are traces of their race as of their conquest in Persia and India.

The ARYAN family have migrated steadily to the south-east and west, and we have historical records of most of their movements. Those that travelled south-east form the TRANS-HIMALAYAN branch consisting of three groups:—

a. **HINDUS.**—They spoke originally Sanscrit, the oldest Aryan tongue. The Brahmans and other high caste Hindus are comparatively pure, but they have mingled with the aborigines, both black and yellow, and also with the successive conquerors—Greek, Persian, Tartar, Arabian, and European.

b. **PERSIANS.**—These have also been much modified by intermixture with Tartar and Arabian Conquerors, but the Parsees still preserve many of their old characteristics.

c. The high caste Japanese and the Ainos are also of white origin, but show much intermixture.

The CIS-HIMALAYAN branch migrated westward by way of the Steppes between the Caspian and the Caucasus and Ural mountains, and seem to have spread, probably as nomadic tribes, in separate waves, which have formed several varieties.

The KELTS group formed the first wave, the extreme western limits of which are now found in the Scottish, Cumbrian, Welsh, and Cornish, Highlands, Western Ireland, Brittany, and parts of Spain. Among these the Gaelic, Cymric, Cornish, Erse, and Armorican groups are distinguished by dialects.

The GREEK and LATIN group formed, perhaps, the next wave, and now occupy Greece, part of Asia Minor, Macedonia, Italy, Spain, and France. It has passed by recent emigration to South and Central America, also in a less degree to Canada and the Southern United States. In a scattered way it has left traces in Syria, Egypt, and North Africa. These groups and the Trans-Himalayans would form the Melanochroi or Dark Whites.

The TEUTONIC group formed the next wave, and shows three groups—the HIGH GERMAN, occupying South Germany and Austria proper, and part of North-east France; LOW GERMAN, occupying North Germany, Holland, part of Belgium, and England; SCANDINAVIAN, in Denmark, Norway, Sweden, and Iceland.

These divisions, especially the second, have peopled North America, South Africa, and Australia, by emigration.

The SLAVONIC group has occupied Russia, Thrace, and parts of Macedonia and Eastern Hungary and Austria, but has not yet colonised to any extent.

The CIRCASSIAN group has remained nearest to the original home of the white race, and has preserved, perhaps with the greatest purity, its distinctive features. It is found in the mountainous regions of the Caucasus.

These groups would form the Xanthochroi or Fair Whites.

THE MONGOLIAN OR YELLOW RACE.—Of the process of distribution of this race little is known. The Chinese and kindred nations seem to have spread but little. The Tartars have been nomadic throughout the historic period, and from time to time great conquerors have arisen among them and have over-run vast regions and established great empires, as Attila, Togrul-Beg, Alp Arslan, Genghis Khan, Mahmud of Ghazna, and Timour or Tamerlane, and they have penetrated into Europe, Arabia, and India, but in most cases their influence and power have not been permanent. The Hungarians, Turks, Lapps, and Finns are still left among the white nations. Of the gradual spread of Malayan and Polynesian races over the islands of the Pacific and to America, as shown by traditions, monuments and present distribution, mention has already been made.

THE ÆTHIOPIAN OR BLACK RACE.—The Black race has no history, and its migrations are therefore obscure. It has spread, however, over the whole of Africa, Madagascar, Australia, Papua, and the adjacent islands, and traces remain of its presence in India and the islands adjacent. Many races or varieties have been formed, and the differences between the Negroes, Gallas, Tibboos, Mandingoes, Hottentots, Caffres, and Bushmen are as great as those between the various groups of whites. The Australian savages are probably the lowest type of humanity now in existence, but the Andaman Islanders and the savages of Tierra del Fuego are very little superior. The latter are not blacks, and may have become degraded by the rude climate and hard life.

It is thought by some that the black race originated in a now sunken land between Asia and Australia, from which they spread in both directions.

LANGUAGE.

The *Science of Language* is called *Philology*; and, though not more than a century old, its results are already considerable and extremely interesting, as illustrating the nature and working of human intelligence. It is quite distinct from grammar and the

study of languages for social purposes, and an acquaintance with its leading principles is easy of attainment.

It has been stated that language is one of the most important marks of the superiority of man over other animals, and it becomes important, therefore, to consider it a little more closely. The origin of language is uncertain, but most authorities consider that words first arose from an imitative sound being made when an object was seen, which sound gradually passed into a conventional word representing that object. We have examples of this even in our highly organised language, as *cuckoo*, and in nursery language, as *moo-cow*, *baa-lamb*, *puff-puff*, while the same origin is clear in such verbs as *hiss*, *roar*, *buzz*, *whirr*, *chirp*, *bang*, &c. The earliest form of language which can be traced, is, however, much less simple. All languages with which we are acquainted seem to have grown up from a limited series of monosyllabic *roots* of two or three letters, which roots express some general idea, and from these are formed whole families of words in which the primitive idea is literally or figuratively preserved. Thus from a root *sta*, meaning *fixedness*, we get *stand*, *stick*, *stack*, *stock*, *stall*, *stable*, *stability*, *establish*, *state*, *estate*, *staunch*, *sturdy*, and many others.

There are three ways in which these roots combine to form words, thus giving rise to the division of languages into three great classes. The first division is the **Monosyllabic**. In languages of this class the root is used alone, or simply joined to another, but no change or addition to it is ever made. The Chinese, Siamese, Burmese, and Thibetan languages are the chief of this division, the whole Chinese tongue being built up of only 450 of these one syllable roots. In English we have examples of this process in such words as *horse*, *man*, *bull*, *dog*, *red*, *hot*, which are simply combined in *horseman*, *bulldog*, *redhot*, &c.

The second division is the **Agglutinative**, in which the roots are similarly combined, but one loses its character of a root by being clipped or shortened, and becomes a mere grammatical ending. These languages are spoken by the remaining Mongols, in Asia, Polynesia, and Hungary, Lapland, and Finland, and by some tribes in southern India and Africa. We have examples in English of this second division in such words as *spoonful*, *beautiful*, *manly* (manlike), *loved* (love-did), *boyhood*, and *freedom*, in which the *hood* and *dom*, once meant *state* or *condition*.

The third variety is called the **Inflectional**, because in this class of languages the meaning of the root is much modified by additions and changes, which in grammar are called "inflections," the syllables added having now no meaning except a conventional one. The languages spoken by the Semitic and Aryan groups of

the white race belong to this third variety. English is one example, but it has lost very many inflections which it once had as Anglo-Saxon, and which are still largely preserved in the kindred tongues, Dutch and German. Yet we still say "the *earth's* motion," and we inflect the verb *speak* thus :—*Speaks, spoke, speaking, spoken*, &c. ; form plurals, as *oxen, arches, teeth, memoranda* ; we compare adjectives and adverbs, as *greater, widest, farther* ; and decline pronouns, as *I, me ; we, us ; thou, thee ; ye, you* ; &c. A great fact to be noticed about languages is that, like living things, they grow up, flourish, and die, and are always undergoing change. The language of one century perceptibly differs from that of the preceding, and if this continues for a long time new languages are formed. Thus we know that since the year 500 A.D., Italian, French, Spanish, Portuguese, and Roumanian have all been formed out of Latin, and though differing widely from each other, a comparison shows at once their relationship to Latin, and all the stages of change or growth can be traced, the genius of each nation directing these modifications in particular ways. In the same way English has grown out of Anglo-Saxon, modern Hindustani out of the old classical Sanscrit, and so on with all languages that have been examined. The most interesting result of this growth is the evidence afforded of the relationship of all the European nations, with the Persians and Hindus, to the original Aryan people of whom we have spoken in the "distribution" of our race ; and further than this, each of the groups there mentioned, Keltic, Greco - Roman, Teutonic, Slavonic, is characterised by a special class of languages closely related to each other, and showing unmistakably their affinity with the other classes. Thus English, which is mainly Teutonic, shews the greatest resemblance to Dutch, another Low German tongue, and a close relationship to the other Teutonic languages, such as German and Swedish, while a connection is distinctly traceable with Latin and Greek, as well as with Welsh, Russian, and even Sanscrit.

The English language has probably passed through all the three stages mentioned above, the inflectional being the latest and most refined stage.

A language is called *dead* when, though no longer spoken, it is studied and read in books of a past time, as Latin, Greek, Sanscrit, and Anglo-Saxon. When it has no literature and is no longer spoken, it is said to be *extinct*. Cornish became extinct in the last century.

Costume.

Clothing was first worn by some savages for adornment and by others for use. Many savage nations wear no covering, but paint or tattoo their bodies, and adorn themselves with feathers, shells, beads, or gems, which they highly prize.

Generally speaking, costume is governed, first, as to quantity and material, by climate and the natural productions of a country, and secondly, as to colour and design, by taste, custom, religion, and fashion.

In tropical Africa, India, and Polynesia many tribes wear scarcely any clothing, and even the little that is worn is of the lightest possible material, and so made that there is no confinement of the limbs or body (see Ashantee, Gold Coast, and Zulu). On the other hand, the Esquimaux (see chart) and the Tartars of the icy Steppes are clothed in furs so completely as often to leave only the eyes exposed. An exception to this rule is found in the Fuegians, on whose naked bodies the cold winds and continual rains of their dreary land beat with full vigour. Their nudity, however, is probably owing to their low culture and positive inability to make clothes.

CLIMATE will account for a variation of the colour of clothing. The inhabitants of sunny climes wear white for coolness, relieved by bright colours, to which they are accustomed in the natural objects around them. The Indian shown on the chart affords an example of this description of costume. As we recede from the tropics, the colours met with become more sombre, until we find the dull browns and greys of the Laplander and Esquimaux harmonising with the dreariness of their dull skies and barren, snow-clad landscapes.

NATURAL PRODUCTIONS must necessarily limit the costume of a country, at least until it has been opened up by commerce, and until native prejudice has been removed. Thus cotton garments were unknown in Europe until the last three or four centuries. Silk was formerly imported in very small quantities, and from

India only. Gold is commonly used for ornaments in Central Africa, as it was formerly in Peru, Mexico, and other places where it was abundant, and diamonds, pearls, &c., have always been worn in India. On the other hand, cotton fabrics are being rapidly introduced into the Pacific islands and Africa from Europe.

TASTE is manifested in the design and harmonious colouring of dress and also in the mode of wearing it. In Italy, Greece, and Spain (see chart) there exists a natural taste for colour combined with a grace of movement which is not to be found among the lower classes of more northern nations. The same taste is possessed by many savage or half-civilised nations, while in others it seems to be wholly wanting, gaudy colours alone being in favour.

CUSTOM has, amongst most nations, gradually established specific styles and designs for dress, varying with sex, age, and rank. The rules, once adopted, soon become very rigid and often absurd. The coloured or gilded buttons coveted by the Chinese mandarins and the crimson border to the Roman citizen's toga of old are examples of the feeling now manifested by western nations in the love of uniforms, official robes, and armorial bearings. Convenience and use, too, have often determined costumes of special occupations.

RELIGION has contributed in many cases to fix particular costumes, to which much respect is accorded; such as the dress of the clergy and of priests and monks; also the wearing of white at marriages, of black at funerals among Europeans, but scarlet or yellow in some other countries.

Costumes have thus become different in different parts of the world, and veneration for old institutions and customs has tended to preserve them as national characteristics. This is particularly the case in isolated districts, where the people are comparatively ignorant, and hold little intercourse with their neighbours. National costumes survive longest in mountainous regions. The Welsh women and Scottish shepherds, for example, have preserved their quaint dresses even to our own times. But another great influence—fashion—has latterly been brought to bear upon the clothing of civilisation.

FASHION has indeed effected a complete revolution, and most civilised nations now dress much alike, and their style is spreading to those in the second grade of civilisation. The most remarkable feature of this revolution is that costume now varies incessantly, in direct opposition to the conservative tendency formerly prevailing.

The Solar System.

The Sun.—The sun consists of a highly heated nucleus, with several envelopes of gaseous matter surrounding it, the inner layers containing heavy metals in a state of gas, and the outer layers lighter gases. These envelopes or layers of gases make up an atmosphere like that round the earth, but possessing a great heat and with many more elements present. Just as there are storms and hurricanes on the earth, there are also terrific cyclones in the sun's atmosphere, which are to be seen with the telescope, sometimes as dark spots, and sometimes as red prominences, according to their condition and position. Though the sun is so large, the materials of which it is composed are much lighter than those of the earth, and its weight is only equivalent to so much water.

The Earth, like the other planets (*planetes* wanderer), moves round the sun in a slightly oval orbit, and consequently its distance from the sun varies a little at different times of the year. Its greatest distance is about 93 millions of miles, and it is then said to be in aphelion (far from the sun). Its nearest approach to the sun is about 90 millions of miles, and it is then said to be in perihelion (near to the sun), and, as the latter occurs in the winter of the northern hemisphere, the season is a little less severe than it would otherwise be.

Rotation.—Day and Night.—Mean Time.—The Earth rotates, *i.e.*, spins round like a top, in 23 hours 56 minutes, and this is called a sidereal day (*sidus*, a star), because the same stars would again be in the same place (if we could see them) at that time. But the earth is also moving onward round the sun; therefore, in order to bring the sun into the same place again, the earth must turn a little more than once round. This requires just four minutes, so that the time from noon to noon is 24 hours; in other words, a solar day is four minutes longer than a sidereal day. But the earth does not always travel at exactly the same speed

and night are each a fortnight long, instead of 12 hours, and as there is no air, and, therefore, no cloud to protect the surface, the sunshine and heat must be very great during the long fortnight's daylight, and the cold proportionately severe during the equally long night.

THE ZODIAC.

As the earth and the other planets revolve round the sun nearly in the same plane, called the plane of the ecliptic, they are all seen in nearly the same line in the heavens. The earth's axis being inclined $66\frac{1}{2}$ degrees to this plane, the equator does not coincide with it, except at two points exactly opposite one another, called the equinoxes. When the earth is at these points in her orbit, the sun is exactly vertical over the equator, and there is an equal division of light and darkness on those days all over the world, the sun rising and setting at 6 o'clock. It is on this account that the name equinox (*equus*, equal; *nox*, night) is given to these points. That which occurs in March is called the vernal or spring equinox, because the spring of the northern hemisphere begins on that day; and that which occurs in September is for a similar reason called the autumnal equinox. These names have to be reversed in speaking of the southern hemisphere.

From the vernal equinox on 21st March to June 21st, the sun is getting daily higher in the heavens and further eastward among the stars, his path in the heavens being indicated by the diagonal line on the map called the Ecliptic; and as the earth is always rotating on its axis, the sun is vertical over places along a line further north every day until June 21st, when he is vertical over the Tropic of Cancer. He is then at his highest point in the heavens of the northern hemisphere, and we have our longest day, while the same day in the southern hemisphere is the shortest of the year. Here, however, the sun stands still, as it were, and this point is called the Solstice (*sol*, sun; *sto*, I stand). That part over which he is vertical is called the Tropic (*trepo*, to turn), because he turns at that point and gradually sinks towards the southern hemisphere. On Sept. 23 he is again vertical over the equator, and we arrive at the period known as the autumnal equinox. He then continues his downward course until Dec. 21st, when he reaches his lowest point, and we are at the winter solstice, the sun being vertical over the Tropic of Capricorn. After the winter solstice the sun again begins his upward course towards the Tropic of Cancer. This apparent movement of the sun is, of course, due to the motion of the earth, combined with the inclination of its axis as already explained.

During the year the sun appears to move continually to the eastward, and as he varies his height above the horizon too, he seems to pass through a certain imaginary band or belt in the heavens, corresponding with the band or zone on the earth between the tropics, and the planets diverge very little from this band, as their orbits are nearly confined to the plane of the ecliptic.

This band of sky lying $23\frac{1}{2}$ degrees on each side of the celestial equator is called the Zodiac, which name was given to it by the Arabian astronomers of the middle ages.

It is divided into 12 parts or signs, and the sun passes through one part or division in a month.

The twelve divisions were named from the fancied resemblance in the arrangement of stars in each division to some figure. The following are their names and the signs which represent them :

♈ ARIES, The Ram.	♎ LIBRA, The Balance.
♉ TAURUS, The Bull.	♏ SCORPIO, The Scorpion.
♊ GEMINI, The Twins.	♐ SAGITTARIUS, The Archer.
♋ CANCER, The Crab.	♑ CAPRICORNUS, The Goat.
♌ LEO, The Lion.	♒ AQUARIUS, The Water- Bearer.
♍ VIRGO, The Virgin.	♓ PISCES, The Fishes.

The sun enters the sign Aries on March 21st, and spring lasts from that day until, on June 21st, he enters Cancer and summer begins ; summer ends when he enters Libra on Sept. 23rd, and autumn begins ; autumn ends on Dec. 21st, when the sun enters Capricornus, and ushers in the winter, which lasts until the 21st March.

The tropics are named Cancer and Capricorn because the sun is in those signs respectively at the periods when he is vertical to the tropics.

The Planets.—These are worlds more or less like our own, all rotating on their axes, and revolving round the sun, and most of them having attendant moons. Those nearer to the sun are smaller than the earth—those farther off are larger. The stars—except the planets—do not belong to the solar system, but are themselves suns at an immense distance from our earth.

Time Dials.—The dials placed at intervals of 30 degrees along the equator shew the true local time of all places on those meridians when it is noon at Greenwich. It will be noticed that westward from the meridian of Greenwich the time is two hours

earlier on each dial, that is, there is a difference of 2 hours of time for every 30 degrees of longitude. In going eastward the time is two hours later on each dial. This gives 4 minutes difference of time for every degree of longitude, or 24 hours, the time of the earth's rotation, for the entire 360 degrees which mark the circumference of the globe.



The Movements of the Ocean.

The Ocean is disturbed in three different ways—by *Waves*, *Currents*, and *Tides*, which are respectively variable, permanent, and periodic.

Waves are produced by winds, and in the open ocean the particles of water move only up and down while the wave travels forward, just as the undulations travel along a shaken rope; but when the wave arrives in shallow water, the lift of the water makes it run higher up the shelving shore, and as the lower part of the wave is retarded by friction against the bottom, the upper part gradually curls over, until it breaks on the shore and the wave dies away. Waves are sometimes seen 36 feet in height, but in British seas they never rise higher than from 7 to 12 feet. The highest waves are found near Cape Horn and the Cape of Good Hope. Waves do not affect the water to a greater depth than 300 feet. Their force is sometimes equal to 3 tons to the square inch.

Currents are movements of different parts of the ocean in different directions, and they aid the distribution of warmth over the temperate regions, and help to cool tropical countries. The ocean becomes by these movements a sort of gigantic hot-water warming apparatus for the whole of the globe.

These currents are produced by differences of temperature and evaporation, and are aided by the constant winds. These movements are known as the *thermal circulation* of the ocean. In the tropics the water is continually exposed to great sun-heat, and as the water thus warmed is light, it remains at the top, and flows off towards cooler regions, while colder water rises from the bottom to take its place. To supply this cold water, a gentle flow takes place from the Polar regions, partly at the bottom and partly at the surface. The flow at the bottom is often stopped by great irregularities in the bed of the ocean, and that at the surface gradually sinks as it approaches the tropics, passing at length under the warmer and lighter water which it meets, but sometimes

running by the side of it for some distance, or mixing slowly with it. The vapour formed by the evaporation of water is chilled as it rises in the air, and falls as rain, part of it in the tropics, and part far to the north and south, over regions to which it has been borne by winds. Thus the rain that falls in England is ocean water from the West Indies and the tropical Atlantic. This rain water finds its way back to the sea by the brooks, springs, and rivers, making up the circulation of water, which is the life blood of the world.

This system of currents would flow directly north and south if the earth were at rest, and there were no land; but as the earth rotates, the equatorial part moves at the rate of about 1,000 miles per hour, while the regions to north and south gradually diminish in speed, until near the poles there is scarcely any motion. The water flowing towards the equator is always travelling to places where the earth is moving faster, and as it cannot at once accommodate itself to this increased speed, it is, as it were, left behind, that is, it seems to move towards the west, and this, with its motion southwards, gives it a current to the south-west, getting more and more westerly as it nears the equator. With the currents flowing north from the tropics, the exact reverse is the case, these being deflected to the eastward, and seeming, therefore, to move to the north-east. A glance at the map of the hemispheres will make this plain. In the Southern hemisphere the flow is north-west and south-east.

But the currents are still further diverted from their course by the shape of the coast along which they move, by islands, which stop or turn them, and by meeting with other currents, so that the whole system of movements becomes rather complex.

The warm water from the tropics loses its heat as it passes into colder regions, and that heat, being given off into the air, helps to warm those countries over which it is carried, while the cold water from the poles chills the air above it, and causes cool winds to blow over the countries adjacent.

Tides.—These are great waves affecting the whole depth of the ocean. They are caused by the attraction of the sun and moon, both of which are continually attracting or pulling the nearest part of the earth towards themselves; but the moon is so much nearer that its power is by far the greater, notwithstanding the great size of the sun. The solid land, of course, resists this attraction, but the water obeys it, and there is, therefore, always a piling up of the latter underneath the moon. Now as the earth moves very fast from west to east, and the moon remains nearly still, the wave also

remaining under the moon seems to travel from east to west round the world, and it would do so if there were no land. But the continents deflect the tidal wave just as they do the ocean currents, and in this way the actual flow of the tides becomes complex. In the broad ocean there is no movement forward, but only a rise and fall of the tide; but in shallow seas and rivers the raising of the level of the sea makes the tide run up along the shallow and sloping shores. When the tide out at sea falls, the overflow of water runs back off the land and out of the rivers and produces "ebb tide."

The highest and lowest points are called high and low water marks.

At the same time, the less attraction exerted on that part of the earth farthest from the moon causes the waters to be left behind, as it were—that is, to pile themselves up so as to produce a second high tide opposite the first. There are thus two tides for every rotation of the earth, which, owing to the moon's motion, takes 25 hours to bring the same point again under the moon.

The sun also makes a very slight tide, and when sun and moon are pulling in the same direction (as at new and full moon), an extra high tide occurs which is called *Spring* tide; but when sun and moon are pulling against one another (*i.e.* at first and last quarter), they slightly neutralise each other, and an extra low tide is the result, which is called *neap* tide.

The rise or fall of the tide is only about two and a half feet in the open sea, but when the water is crowded into narrow bays and channels, or into the estuaries of rivers, it rises from 12 to 70 feet with each tide. On the east coast of England the rise is about 12 feet, and in the rivers from 15 to 18 feet; but on the west, owing to the set of the tide, it reaches 40, 50, or even 70 feet, as in the rivers Wye, Severn, and Avon, where it also rushes up as a great wave called "the bore."

It is obvious that this movement of water continually from east to west against the motion of the earth must act very slightly by friction as a drag or break upon the earth, and in time slacken its speed so as to make the day a little longer. The slackening is, however, so infinitesimal that its rate has not yet been actually calculated. Still, it is believed that our day was once less than a quarter of its present length, and that it will continue through countless ages to be lengthened by the tides, until it attains a duration equal to that of the revolution of the moon, which (itself slowly lengthening) will then be about 58 days, and that month and day will thus be again, as they were in the remote past, of equal length.

Climate.

Climate may be defined as the average of the weather experienced in any particular place. It depends first on the *distribution of the sun's heat*, which is affected by the distance of the place from the equator. The climate which would be produced by this cause alone is called *Astronomical* climate. It is taken as the standard by which to measure the differences produced by various other causes, which determine the actual or *physical climate*.

The world is astronomically divided into five *zones* or *belts*, in which temperature, and therefore climate varies considerably. The space between the Tropics extends, $23\frac{1}{2}$ degrees on each side of the Equator, and is called the *Torrid Zone*. As the sun is always vertical over some part of this region, it is the hottest and the wettest on the face of the globe, and is distinguished by its huge animals and its luxuriant vegetation.

On each side of this zone extend the Temperate Zones, 43 degrees in breadth, reaching from the Tropic of Cancer to the Arctic Circle on the north, and from the Tropic of Capricorn to the Antarctic Circle on the south. In these zones there is a marked change from winter to summer, and variable rains and winds prevail. Snow generally falls here in winter, and life is less luxuriant, though quite as vigorous, as in the tropics. In the frigid zones, north and south, the cold is excessive, and the short summer of only a few weeks is insufficient to melt the great accumulations of snow and ice formed during the winter. In these icy climes only mosses and lichens and a few dwarfed shrubs give food to a few animals such as the reindeer.

As already stated, climate varies considerably, even between places in the same latitude. The variations arise from the following five causes.

1. **Elevation** above the sea. Heat diminishes as we ascend, so that on high mountains, as the Himalayas, perpetual snow is found, even in the Torrid Zone.

2. Nearness to the Sea.—The ocean, as elsewhere mentioned, acts as an equaliser and distributor of heat, and therefore, places which are near its shores, besides being necessarily little elevated, are warmed by the heat that it brings from equatorial regions.

3. Direction of prevailing winds.—These have an important influence. If the winds come from the tropics, they will be moist and warm, much rain will fall, and the country will be fertile and genial; while if they come chiefly from the poles, they will be so dry and cold that the land must remain almost a desert. Ireland is an example of a land with warm and moist winds, the Thibetan Desert is an example of one with dry and cold winds.

4. The height and direction of neighbouring mountains and hills.—The mountains cause the air to precipitate its moisture in the form of rain, by forcing it to rise into colder regions in order to pass onwards. When thus chilled it cannot hold so much moisture as before, and therefore the excess falls as rain. If there are no hills in a district, the moist air will pass over it, and but little rain will fall. We see a good example of this in the difference between the flat eastern parts of England, and the hilly western counties, where rain is almost of daily occurrence. The two sides of a range that lies across the wind's path shew a wonderful difference in rainfall, and consequently in climate.

5. The situation or aspect.—If a place be exposed on a hill top, or on the north or east side of a chain of hills, especially in the regions of variable winds, it will often be shaded from the sun and experience great cold in winter; but if it lie in a sheltered valley, or in a bay on the south or west side of a hill-range, it will be protected from the cold winds and always open to the sun. The difference between Scarborough and Eastbourne, as cold, bleak places, and Hastings, Ventnor, or Torquay, as warm, sheltered places, explains this effect of position.

Some or all of these causes often act together, and thus there are two very different sorts of climate, which are known as *Continental* and *Insular*.

The **Continental climate**, felt in the interior of continents far from the sea, is characterised by great extremes of heat and cold, little rain or cloud, and clear, dry air. Such a climate is found in Austria, Russia, and Central Asia, and in the Prairie and Rocky Mountain regions of the United States.

An Insular climate is one in which the modifying influence

of the sea is strongly felt, and it is therefore more equable. The summers, though warm and moist, are never tropical; the winters are mild, and there are many wet days throughout the whole year. England is an example of this kind of climate. To contrast an insular with a continental climate, we may mention that Madeira shows a difference of only ten degrees between the average summer and winter heat, whereas in Siberia the difference is more than 100 degrees.

As an example of the extreme differences which these causes are competent to produce, we may notice England, which has a mean winter temperature of about 40 degrees, with little snow or ice, as compared with Hudson's Bay in North America, *in the same latitude*, which has a most intense winter cold for six months of the year, the average temperature of the winter being about zero, and ice forming on the lakes to a thickness of several feet.



Progress of Geographical Discovery.

To the ancients this world bore an aspect far different from that which it presents to us. To them the Mediterranean Sea was really, as its name signifies, in the middle of the earth, for round its shores clustered all the nations of early civilisation. The idea was that the land lay in a flat plain all round this sea, at about an equal distance, and that outside the land flowed the great world river, called the Ocean Stream, into which venturesome mariners sometimes passed through the Pillars of Hercules (Strait of Gibraltar) to trade with the gloomy and remote Cassiterides or Tin Islands, as they called Britain. The sun they thought passed round by this stream during the night, to rise again in the East on the morrow. The Phœnicians from Tyre and Sidon, and the Carthaginians (a colony of Tyre) were the navigators of those times, and it is believed that Hanno, a Carthaginian, sailed round Africa.

Alexander the Great pushed eastward to the Indus, but nothing was known of the regions beyond. The Romans penetrated into Northern Europe, finding that there was not, as they had thought, perpetual darkness, as far as modern Denmark. They learned something too of Southern Russia and Northern Africa.

In the middle ages nothing new was learned and much was forgotten, until the Crusades caused trade to spring up between the East and the West, and taught Europeans the value of the products of India and the East. Marco Polo, the Venetian traveller, advanced to Cathay or China (1272-1295), and the English Mandeville wrote a work on travels in the same regions in 1355.

The first to make really great efforts to push out into the Atlantic were the Portuguese, under their enterprising Prince Henry, surnamed "The Navigator," the son of King John I. Early in the 15th century (1416), they began systematically to explore West Africa, discovering some new headland every voyage, passing Guinea and the Niger, and venturing out to the Azores, Madeira, Canaries, and Cape Verde Isles, till at last Bartolomeo Diaz, in

1487, reached the Cape of Storms, which the King, thinking it indicated a possible route by sea to India, renamed the Cape of Good Hope. In 1497 Vasco di Gama rounded the Cape and turned northwards, arriving at Calicut, in India, after a voyage of 15 months, a voyage celebrated by the poet Camocus in his poem the "*Lusiad*."

Meanwhile, in 1492, Columbus had discovered America, and commenced Spanish maritime and military enterprise and expansion. Amerigo Vespucci carried his explorations on to the Continent of America. Cortez conquered Mexico, and Pizarro attacked and destroyed the Peruvian empire. Vasco Nunez de Balboa toiled through the tropical forests and mountains of Darien and reached the shores of the Pacific, and a vast empire soon grew up, with Hispaniola (or San Domingo) as its central seat. While these events were occurring in the Western Hemisphere, Magellan circumnavigated the globe, and the Spaniards and the Portuguese met in the Indian Islands.

The Dutch, however, had begun to dispute the possession of the East with Spain and Portugal, and England, having also made discoveries, now began to colonise in North America. Cabot discovered Newfoundland in 1496; Chancellor penetrated to Russia by the White Sea in 1554; Frobisher and Davis (1576-8) explored the N.E. of America and the West of Greenland. Raleigh named Virginia in 1584; Hudson perished in the bay bearing his name (1611); and Baffin (1616) attained the farthest point to the North-West.

The Dutch conquests in the East led their rivals, the English, to follow them thither. An East India Company was formed in 1600 by Queen Elizabeth, and the first factory was established at Surat in 1611.

Van Diemen, the Dutch Governor of the Indies, sent Tasman in 1642 to explore the S.E. Ocean. This navigator discovered the Island of Tasmania or Van Diemen's land, and explored some parts of Australia, then but slightly known, under the name of New Holland. Dampier in 1690 sailed into the same region, but it was comparatively unknown till the voyages of Captain Cook in 1768-79, since which time British colonisation has progressed, slowly at first, but recently with great rapidity.

In America during this time the French settled on the North of the Gulf of Mexico, in Louisiana, Alabama, Mississippi, &c., and in Canada, at Quebec, and on the St. Lawrence shores; the British spread South and West to South Carolina (named after Charles II), and Georgia (named after George II); and the Spaniards held

Florida, Mexico, California, and the greater part of South America; the Portuguese, however, retaining the vast empire of Brazil.

In our own times, discoveries have been chiefly confined to three channels, viz., North Polar, South Polar, and African. The North Polar regions have been explored, under Parry (1827); Ross (1829-33); Franklin (1845-48); McClure (1850); McClintock (1857); Koldewey (1869); Hall (1871); Weyprecht (1872); Nares (1875); Nördenskiöld in 1878-9.

The South Polar regions are less known, but expeditions have been sent thither under Smith (1816); Bellinghausen (1821); Biscoe (1831); Balleny (1839); Dumont d'Urville (1840); Sir J. Ross (in the *Erebus* and *Terror*) 1841; and Nares (in the *Challenger*) 1873-4.

In Central Africa, explorations have been carried on by Bruce (1769) on the Blue Nile; Mungo Park (1795-1805) on the Niger; Clapperton and Lauder (1822-30); Bartle (1849); Rohlfs and Nachtigal, on Lake Tchad and its basin; Livingstone on the Zambesi, Congo and L. Tanganyika (1849-73); Speke, Grant, Baker, and Burton on the Nile and Equatorial lakes (1858-65); Du Chaillu (1861); Stanley, on the Congo, in 1874; and Serpa Pinto (1878) from Lake Ngami to Natal.



ALPHABETICAL INDEX

To the Names Mentioned on the Hemispheres.

NAMES ABBREVIATED ON THE MAP ARE HERE GIVEN IN FULL.

ABBREVIATIONS:—S—State or Country. T—Town. R—River. M, Mts.—Mountains.
V—Volcano. C—Cape. I—Island. L—Lake. G—Gulf. B—Bay. Str.—Strait.

British Towns and Possessions marked thus *

Abeokuta T ...	8° 4' E	Austin T ...	30° 9' W	*Brisbane T ...	27° 15' S
Abyssinia S ...	12° 30' E	Azores Is ...	37° 20' W	Brown Mt ...	52° 11' S
Acarai Sierra (Mts.)	2° 55' W			Brownsville T ...	28° 9' W
Acheen T ...	5° 9' E	Bab-el-Mandeb Str	13° 43' E	Brussels T ...	50° 4' E
Aconcagua M ...	23° 70' W	Raffin's Bay ...	75° 70' W	Buenos Ayres T ...	34° 58' S
*Adelaide T ...	31° 13' E	Bagdad T ...	33° 44' E	Buffalo T ...	42° 70' W
Adelle Land ...	66° 140' E	*Bahama Is ...	25° 76' W	Bukharest T ...	44° 26' N
*Aden T ...	12° 41' E	Bahia T ...	12° 38' W		
Afghanistan S ...	33° 65' E	Baikal Lake ...	53° 108' E	Cabul T ...	34° 69' E
*Agra T ...	27° 70' E	Balkash Lake ...	46° 75' E	*Caios Is ...	22° 72' W
Agulhas O ...	34° 20' E	Ballynny Is ...	67° 105' E	Cairo T ...	30° 31' E
Alaska S ...	65° 155' W	Baltimore T ...	39° 74' W	Cairo T. (U.S.A.)	37° 39' W
Albany T ...	42° 73' W	*Bangalore T ...	13° 77' E	*Calcutta T ...	22° 88' E
Aleppo T ...	36° 37' E	Bangkok T ...	13° 100' E	Callao T ...	12° 77' W
Aleutian Is. ...	52° 174' W	Banks Str ...	74° 116' W	Cameta T ...	2° 49' W
Alexandria T ...	31° 29' E	Bangweolo Lake ...	12° 29' E	Campeachy T ...	20° 90' W
Alexandria T (U.S.)	31° 21' W	*Barbadoes I ...	13° 30' W	Canary Is ...	28° 16' W
Algiers T ...	36° 3' E	Barbary S ...	32° 5' E	Candahar T ...	31° 6' N
*Allahabad T ...	25° 82' E	Barcelona T ...	41° 2' E	Canton T ...	23° 113' E
Alleghany Mts. ...	37° 80' W	Barlee Lake ...	29° 120' E	*Cape Coast Castle	5° 0'
Amazon R ...	0° 60' W	*Baroda T ...	22° 73' E	*Cape Town T ...	33° 18' S
Amiranto Is ...	6° 53' E	Basra (Basorah) T	30° 48' E	Cape Verde Is ...	16° 25' W
Amu Daria R ...	39° 64' E	*Basuto Land S ...	29° 27' E	Caraccas T ...	10° 47' W
Amoor R ...	51° 130' E	Batavia T ...	6° 106' E	*Caroline Is ...	10° 144' E
Amoy T ...	24° 118' E	*Bathurst T ...	13° 17' W	Carpentaria G ...	15° 139' E
*Amrit-ir T ...	31° 74' E	*Battleford T ...	53° 110' W	Cartagena T ...	10° 75' W
Amsterdam T ...	52° 4' E	*Belize I ...	17° 8' W	Cartagena T ...	37° 1' W
Amsterdam I ...	37° 79' E	Bellisle Str ...	51° 57' W	Cascade Range Mts	45° 121' W
Anam S ...	17° 104' E	Beloochistan S ...	27° 63' E	Cashmere T ...	34° 76' N
*Andaman Is ...	12° 93' E	*Benares T ...	25° 83' E	Cayenne T ...	5° 52' W
Andes Mts ...	0° 80' W	*Bengal B ...	19° 87' E	*Cayman Is ...	19° 81' W
	50° 72' W	Herlin T ...	52° 13' E	Cedar Keys T ...	29° 83' W
Angostura T ...	8° 61' W	*Bermuda Is ...	32° 64' W	Celbes I ...	4° 121' E
*Antipodes I ...	49° 178' E	Black Sea ...	43° 34' E	*Ceylon I ...	7° 81' E
Arafura Sea ...	11° 133' E	Blanc Mont ...	48° 7' E	Chad Lake ...	13° 14' E
Aral Sea ...	45° 00' E	Bogota T ...	4° 74' W	*Chagos Is ...	8° 72' E
Archangel T ...	64° 40' E	Bokhara T ...	39° 64' E	Charkow T ...	50° 86' E
Arequipa T ...	16° 71' W	Bolor Tagh Mts ...	38° 72' E	Charleston T ...	32° 80' W
Arica T ...	18° 70' W	*Bombay T ...	19° 73' E	Chatham I ...	9° 170' W
Arkansas R ...	35° 93' W	Bonin Is ...	27° 143' E	Chesapeake B ...	38° 70' W
Ascension I ...	8° 14' W	Bordeaux T ...	44° 4' W	Cheyenne T ...	41° 105' W
Astrakhan T ...	46° 48' E	Borneo I ...	0° 114' E	Chicago T ...	42° 87' W
Auncon T ...	35° 57' W	Boston T ...	42° 71' W	Chihuahua T ...	28° 100' W
Atlanta T ...	34° 81' W	Bounty I ...	47° 170' E	Chiloé I ...	42° 74' W
Athens T ...	38° 24' E	Bouvet Is ...	54° 5' W	Chimborazo M ...	1° 78' W
*Auk and T ...	30° 174' E	*Brahmapootra R	21° 90' E	*Christchurch T ...	43° 172' E
*Auckland I ...	51° 146' E	Breslau T ...	51° 17' E	Christiana T ...	59° 11' E

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Cincinnati T	... 39N 84W	Franz Joseph Land	83N 65E	Java I	... 7S 110E
Cleveland T	... 41N 81W	*Freetown T	... 8N 12W	Jerusalem T	... 32N 35E
Cobia T	... 22S 70W	Friendly Is	... 20S 173W	Jidda T	... 21S 30E
Cochabamba T	... 17S 68W			*Jodpur T	... 28N 73E
*Colombo T	... 7N 80E	Galapagos Is	... 0 80W	Juan Fernandez I	33S 78W
Colon T	... 9N 80W	Galveston T	... 29N 65W	Jubb R	... 8S 11E
Colorado R	... 34N 114W	*Gambia (Bathurst)	33N 16W		
Columbia T	... 34N 81W	Ganges R	... 23N 90E	Kagosima T	... 35N 139E
Columbia R	... 40N 123W	Genoa T	... 44N 9E	*Kameran I	... 16N 43E
Columbus T	... 40N 83W	*Georgetown T	... 7N 58W	Kamtchatka S	... 56N 159E
Comayagua T	... 14N 87W	*Gibraltar T	... 36N 5W	Kaudahar T	... 31N 65E
Comorin O...	... 8N 77E	*Glasgow T	... 60N 4W	Kano T	... 12N 8E
Oongo R	... 7S 18E	Gon T	... 15N 74E	Kansas City	... 38N 98W
Constantinople T...	41N 29E	Gombroon T	... 27N 60E	Kazan T	... 43N 26E
*Cooktown T	... 16S 145E	Gondar T	... 12N 37W	Kashgar T	... 39N 74E
Coomassie T	... 8N 1W	Goyaz T	... 16S 44W	Kashmere T	... 34N 76E
Copenhagen T	... 55N 12E	Graham Land	... 65S 65W	*Keeling I...	... 13S 98E
Copapo T	... 27S 70W	Graham's Town	... 33S 28E	Kelat T	... 29N 66E
Coral Sea	... 14S 149E	*Great Bear Lake	66N 120W	Kemp Land	... 67S 60E
Cordova T...	31S 64W	Great Salt Lake		Kerguelen I	... 49S 70E
Corea Pen...	38N 127E	City	... 41N 112W	Kermadec I	... 30S 180E
Crozet's Is...	... 46S 50E	*Great Slave Lake	61N 115W	Kesho T	... 21N 105E
Cuba I	... 22N 80W	Greece S	... 37N 22E	Key West I	... 21N 82W
Cuenca T	... 3S 79W	Greenland S	... 70N 40W	Kiackta T	... 50N 116E
Camana T...	... 10N 64E	*Grigvaland West S	27S 24E	Kiev T	... 50N 30E
*Cuttack T	... 20N 86E	Guadalajara T	... 20N 103W	Kilimandjaro M	... 3N 37E
Cuyaba T	... 16S 57W	Guadeloupe I	... 20N 118W	*Kingston T	... 18N 76W
*Cyprus I	... 35N 33E	Guajuato T	... 21N 100W	Kin-te-ching T	... 20N 117E
		Guardafui C	... 12N 51E	Kietcheu T...	... 20N 110E
Damascus T	... 33N 36E	Guatemala T	... 14N 90W	Kinsin I	... 32N 131E
Danger Point C	... 28S 153E	Guayaquil T	... 2S 80W	Knox Land	... 67S 106E
Danube R	... 45N 23E	La Guayra T	... 10N 67W	Kong Mts	... 8N 5W
*Darwin Port T	... 13S 131E	*Guiana S (Brit.)	6S 50W	Kongsberg T	... 63N 14E
Davis Straits	... 67N 58W	Guiana (Dutch)	... 6N 55W	*Kooria-Mooria Is	17N 55E
*Delhi T	... 28N 77E	Guiana (French)	... 6N 52W	Kosgol Lake	... 50N 101E
*Demerara T	... 7N 54W	Guinea G	... 2N 0	Kuenlun Mts	... 30N 90E
Denver T	... 40N 105W			Kulda T	... 44N 81E
Detroit T	... 42N 83W	Haiderabad T	... 17N 78E	Kurle Is	... 47N 154E
Disraeli B	... 64N 75W	Haiti or Hayti I...	19N 71W	*Kurrachee T	... 24N 67E
Djokjokarta T	... 8S 110E	Halifax T	... 44N 63W		
Dnieper R	... 46N 32E	Hamburg T	... 53N 10E	*Labrador S	... 55N 63W
Dresden T	... 51N 14E	Hang-chow T	... 30N 121E	*Labuan I...	... 5N 115E
*Dublin T	... 53N 6W	Havana T...	... 23N 82W	*Laccadive Is	... 11N 72E
Ducie Is	... 25S 125W	Hawaii I	... 19N 155W	Ladrone Is	... 17N 140E
*Dunedin T	... 48S 170E	*Heligoland I	... 54N 8E	*Lagos Is, &c.	... 7N 4E
Durango T...	24N 104W	Herat T	... 34N 62E	Lassa T	... 30N 91E
Dwina R	... 61N 41E	Hervey Is	... 19S 158W	*Leeward Is	... 20N 75W
		Himalaya Mts	... 31N 80E	*Leeward Islands, viz:—	
*Edinburgh T	... 60N 3W	Hoang-ho R	... 34N 119E	Virgin Islands...	18N 65W
Ekaterinburg T	... 57N 60E	*Hobart Town T...	43S 147E	St Christopher's	17N 63W
Ellice Is	... 7S 170E	*Honduras British S	17N 29W	Anguilla	... 18N 63W
Enderby Land	... 66S 49E	*Hong-Kong T	22N 114E	Nevis & Redonda	17N 63W
Espinaco Sierra M	15S 42W	Honolulu T	... 21N 154W	Antigua	... 17N 62W
Esequibo R	... 7N 53W	Horn Cape...	... 56S 67W	Barbuda	... 18N 62W
Euphrates R	... 32N 44E	*Howe, Lord, I	31S 159E	Montserrat	... 17N 63W
Everest Mt.	... 29N 87E	Hudson's B	... 60N 87W	Dominica	... 16N 61W
Eyre Lake	... 29S 137E	Hue T	... 16N 107E	Lena R	... 71N 124E
		Huron Lake	... 45N 82W	Leon T	... 12N 60W
		Huntsville T	... 35N 80W	Liberia S	... 5N 9W
				Lima T	... 12S 77W
*Falkland Is	... 51S 59W			Limpopo R	... 22S 23E
*Fanning I...	... 3N 155W	Iceland I	... 65N 18W	Lisbon T	... 38N 9W
Farewell C	... 60N 44W	Ichaboe I	... 27S 15E	*Liverpool T	... 63N 3W
Fernando Po I	... 3N 8E	Indianapolis T	... 40N 86W	Livingstone R	... 0 20E
Fez T	... 34N 5W	*Indus R	... 33N 72E	Livingstonia T	... 14S 34N
Fezzan S	... 26S 15E	Irkutsk T	... 52N 104E	Loango T	... 4S 12E
*Fiji Is	... 16S 180E	Irish R	... 60N 69E	*London T...	... 51N 0
Florence T...	44N 11E	Isbahan T...	... 32N 61E	Loochoo Is...	... 28N 127E
Fly River	... 7S 142E			*Lord Howe I	... 31S 159E
Foochoo T	28N 116E			Louisville T	... 39N 83W
Formosa I...	23N 121E	*Jamaica I...	18N 77W		
	... 60S 87E	Janan Is	... 35N 140E		

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Lualaba R...	6s 27 E	New Orleans T	37N 97W	*Quebec T ...	47N 71W
*Lucknow T	27N 81 E	*N Westminster T	44N 122W	*Queen Charlotte I	53N 132W
Luzon I	16N 121 E	New York T	41N 71W	*Queensland S	23E 145N
Lyons T	46N 5 E	*Nicobar Is.	8N 93 E	Quito T	0 0 78W
		Nicolajevsk T	54N 140 E		
Macao T	22N 113 E	Niger R	4W 6 E	Rabba T	9N 5 E
*Mackenzie R	67N 130W	Nile R	30N 31 E	*Raungon T	17N 96 E
Macquarie Is	31S 148 E	Nippon I	3 N 139 E	Recife (or Pernamb)	
Madagascar I	20S 47 E	Norfolk T	37N 76W		8N 30W
Madeira I	32N 17W	*Norfolk I	29S 108 E	Red River	34N 95W
*Madras T	13N 80 E	*Nova Zembla I	74N 55 E	Red R of the North	49N 97W
Madrid T	40N 3W	*Nova Scotia S	45N 61W	Réunion or Bour-	
Magellan Str	53S 74W	Nyanza, Albert L	1N 31 E	bon I	21N 55 E
*Malacca T	3N 103 E	Nyanza, Victoria L	1 S 33 E	Revillagigedo Is...	19N 110W
Malacca Str	5N 98 E	Nyassa Lake	12 S 37 E	Richmond T	37N 77W
Malay Penins	8N 101 E			Riga T	57N 24 E
*Malden I	4S 156 E			Rio de Janeiro T...	23S 43W
Maldiva Is	5N 73 E	El Oheid T...	18N 80 E	Rio de la Plata R...	38S 53W
*Malta I	36N 14 E	Obi R	66N 67 E	Rio Grande del	
Mandabay T	22N 97 E	Odesa T	44N 31 E	Norte R	29N 100W
Manilla T	15N 121 E	Okhotsk Sea	55N 150 E	Rocky Mountains	43N 110W
Marianne Is	17N 143 E	Omaha T	41N 96W	Rome T	42N 13 E
Marocco S...	32N 5W	Osaka T	55N 73 E	Rostov T	47N 39 E
Marquesas Is	8N 14W	Oporto T	41N 8W	Rouen T	49N 1 E
Marseilles T	43N 5 E	Oran T	35N 1W		
Marshall Is	11N 166 E	Orange R	28 S 17 E	Sacramento T	38N 121W
Matamoros T	26N 87W	Orenburg T	52N 65 E	Saghalien I	50N 143 E
Matsumi T	41N 140 E	Orinoco R	5N 68 E	Saghalien Oula I	50N 127 E
*Mauritius I	2N 57 E	Ormuz Str	26N 66 E	Sahara Desert	23N 5 E
Mecca T	21N 40 E	*Ottawa T	45N 78W	Saigon T	10N 106 E
Medina T	25N 40 E	Ouro Preto T	20 S 43W	St. Augustine T	30N 81W
Me-kong R	10N 107 E	Palawan I	10N 119 E	St. Khas Mt	60N 141W
*Melbourne T	38N 145 E	Palermo T	38N 13 E	*St. Helena I	16S 5W
Melville Sound	73N 107W	Pa-myra I	6N 162W	St. Helen's Mt	47N 121W
Memphis T	35N 90W	Panama T	9N 79W	St. John T...	45N 68W
Mequinez T	34N 8W	Para T	1 S 48W	*St. John's (Newf)	
Meekle T	36N 59 E	Parahyba T	7 S 34W	T	47N 53W
Mexico T	19N 99W	Paramaribo T	7N 54W	St. Lawrence I	63N 170W
Miako T	35N 135 E	Parana R	30 S 59W	*St. Lawrence R	47N 70W
Michigan Lake	43N 87W	Parina C	5 S 81W	St. Louis T	38N 90W
Milwaukee T	43N 83W	Paris T	49N 2 E	St. Paul T	45N 93W
Mississippi R	33N 91W	Pasco T	10 S 76W	St. Paul de Loanda	
Missouri R	30N 92W	Paz, La, T	16 S 68W	T	9S 13 E
Mobile T	30N 88W	Pekin T	40N 116 E	*St. Paul I	3 S 79 E
Monrovia T	6N 11W	Pelew Is	7N 135 E	St. Petersburg T	60N 30 E
Monterey T	25N 100W	*Pennang I	6N 100 E	St. Thomas I	18N 64W
Monte Video T	35S 56W	*Perim I	12N 43 E	Salomon Is	9S 162 E
Montgomery T	32N 82W	Pernambuco T	8 S 36W	Salonica T	40N 23 E
*Montreal T	45N 73W	*Perth T	32 S 116 E	Saltillo T	25N 101W
Moore Lake	29S 117 E	Philadelphia T	40N 75W	Samara T	53N 50 E
Moscow T	55N 37 E	Philippine Is	12N 123 E	*Samoa (or Navigr)	
*Moshia I	12N 44 E	Pietermaritzburg T	29S 30 E	Is	12S 170 E
*Mozambique Str	15S 38 E	Pitcairn I	25S 130W	Sana T	15N 4 S
Murray R	34S 140 E	Pittsburg T	40N 80W	San Domingo or	
Muscat S	23N 58 E	Plata, La, R	30 S 6 W	Havti I	16N 71W
		Pondicherry T	12N 80 E	San Francisco T	3N 122W
		Papayan T	2N 76W	San Francisco R	24S 54W
Nankin T	32N 118 E	Popocatepetl M	19N 98W	San José T	10N 84W
Nantes T	47N 2 E	Portland T	45N 68 S	San Paulo T	22S 48W
Naples T	41N 14 E	Port Darwin T	12 S 131 E	San Pedro T	5N 65W
*Natal S	29S 30 E	Port Louis T	20 S 67 E	San Salvador I	7 S 15 E
*Navigator Is or	12 S 170 E	Porto Alegre T	19 S 40W	Sandwich Is	22N 152W
Samoa Is		Porto Rico I	18N 68W	Sandwich Land	5 S 30W
Negro R	0 65W	Prague T	50N 14 E	Santa Fé T	36N 106W
*Nelou R	56S 85W	Potosi T	19 S 63W	Santarem T	3 S 55W
Nertchinsk T	51N 119 E	Prince of Wales I		Santiago T	33S 70W
Nevada Sierra (M)	36N 120W	or Penang	5N 100 E	Saratov T	51N 48 E
New Britannia Is	5 S 151 E	Puebla, La, T	19N 93W	Savannah T	32N 81W
*Newfoundland I	49N 55W	Providence T	42N 72W	Sego T	12N 7W
New Hebrides Is...	16S 103 E				

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Senegal R. ...	12N 10W	Tallahassee T ...	30N 81W	Venice T ...	45N 12E
Senegambia S ...	13N 14W	Tampico T ...	21N 98W	Vera Cruz T ...	19N 90W
Sevastopol T ...	44N 33E	Tananarivo T ...	18S 47E	Verde Cape ...	15N 17W
Seville T ...	37N 6W	Tanganyika L ...	6S 30E	Victoria Nyanza L ...	1S 33E
Seychelles Is ...	4S 55E	Tashkend T ...	43N 68E	Vienna T ...	48N 16E
Shanghai T ...	31N121E	*Tasmania I ...	42N147E	*Viti Levu I ...	18S 175E
Shiraz T ...	29N 52E	Tchad Lake ...	13N 14E	Volga R ...	49N 45E
Shreveport T ...	32N 93W	Teheran T ...	38N 51E		
Siam S ...	16N100E	Tehuantepec T ...	16N 95W	Waday S ...	13N 13E
*Sierra Leone S ...	8N 13W	Teng T ...	37N121E	*Walwich (Waldsh)	
Si-Kiang R ...	22N107E	Thian Shan Mts ...	42N 80E	Bay S ...	22S 14E
Sikok I ...	33N133E	Tien-tsin T ...	39N117E	Warsa T ...	14N 21E
Singan T ...	34N109E	Tierra del Fuego S ...	54S 71W	Warsaw T ...	52N 21E
*Singapore T ...	1N103E	Tiflis T ...	41N 45E	Washington T ...	39N 77W
Sioo-choo Is ...	34N117E	Timbuctu T ...	17N 3E	*Wellesley Prov ...	6N100E
Sioak T ...	27N 31E	Timor I ...	0-125E	*Wellington T ...	41S 174W
Sir Daria R ...	45N 64E	Titicaca Lake ...	15S 69W	Western Icarazores	37N 28W
Smymna I ...	38N 27E	Tobolsk T ...	58N 67E	White Sea ...	68N 40E
Spitzbergen Is ...	78N 20E	Tocantins R ...	6S 49W	Wilmington T ...	34N 77W
Society Is ...	16S 150W	Toledo T ...	42N 83W	*Windward Is, viz.:	
Socotra I ...	12N 53E	Tomsok T ...	56N 81E	Saint Lucia ...	14N 61W
Sofala S ...	20S 34E	*Toronto T ...	43N 79W	St. Vincent ...	13N 61W
Sokoto T ...	13N 5E	Torres Str ...	10N 143E	Barbadoes ...	13N 60W
South Georgia I ...	54S 37W	*Transkei S ...	33S 27E	Grenada and	
South Orkney Is ...	61S 48W	Transvaal S ...	26N 23E	Grenadines ...	12N 62W
South Shetland Is	62S 60W	Trieste T ...	45N 13E	Tobago ...	11N 61W
South Victoria ...	72S173E	*Trinidad I ...	10N 61W	*Winnipeg Lake...	63N 93W
*Starbuck I ...	5S 155W	Tripoli T ...	32N 13E	Wrangell I ...	72N180
*Staten I ...	54S 61W	*Tristan d'Acunha	31S 12W		
Stewart I ...	47S 163E	Trujillo T ...	18N 86W	Yakutsk T ...	62N120E
Stockholm T ...	59N 18E	Tucuman T ...	27S 66W	Yang-tze-Kiang R	31N121E
Stookton T ...	37N121W	Tu'a T ...	64N 33E	Yaakton T ...	43N 98W
*Straits Settlements, viz.:		Tunis T ...	37N 10E	Yarkund T ...	38N 76E
Singapore ...	1N103E	Tunja T ...	5N 74W	Yedo T ...	36N189E
Province Welles-		Turin T ...	45N 8E	Yellow Sea ...	35N123E
ley ...	6N100E	*Turk Is ...	21N 71W	Yenisei R ...	63N 88E
Penang ...	5N104E			Yesso I ...	44N142E
Malacca ...	3N104E	Ucayali R ...	7S 75W	Yokohama T ...	35N139E
Suez Canal ...	30N 32E	Union Is ...	8N 172W	*York Port ...	57N 93W
Sumatra I ...	0 102E	Oral Mts ...	61N 60E	York Peninsula ...	17S 143E
Superior L ...	47N 88W	Ural R ...	49N 51E	Yucatan T ...	19N 89W
Surabaya T ...	7S 120E	Uruntsi T ...	43N 88E	Yunnan T ...	25N103E
Surinam T ...	5N 55W				
*Swan R ...	31S 116E	Valdivia T ...	40S 73W	Zacatecas T ...	22N102W
*Sydney T ...	34S151E	Valencia T ...	29N 0	Zaire or Congo R...	6S 12E
		Valencia T ...	10N 68W	Zambesi B ...	18S 35E
Tabreez T ...	38N 46E	Valparaiso T ...	33S 71W	Zanguebar S ...	5S 39E
Tahiti I ...	18S 149E	*Vancouver I ...	50N126W	Zanzibar I ...	6S 39E
Tai wan (For-		*Vanua Levu I ...	17N 179E	Zululand S ...	58S 32E
mosa) I ...	23N121E	Venezuela S ...	8N 60W		

